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ECONOMICS OF PUBLIC UTILITIES

ECONOMICS
OF
PUBLIC UTILITIES

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RINEHART & COMPANY, INC.
PUBLISHERS NEW YORK

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by J. J. Little and Ives Company, New York

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To MARJORY

Preface

IF I were to say simply that this is a book about the economics of public utility services and their management, most readers would know or could imagine the general nature of the materials and the methods of analysis. In a broader sense, however, this is a study of a social conflict, a conflict between private enterprise and the public welfare that in our country is resolved either by public regulation or by substitution of public for private ownership and management. Since it systematizes American experiences with both private and public production of utility services, examines the relationships between public regulation and private management, and analyzes the economic and social consequences of regulated private management and of public ownership, the work is a study in social control.

A product of my teaching experiences, the book is designed primarily as a text for college courses in public utility economics—for courses that are concerned mostly with the water, urban transportation, gas, electric, and telephone industries. Students who are beginning this subject should find no difficulty with my development of the ideas, though it should be noted that in some chapters a knowledge of elementary economic analysis, particularly of market pricing, is assumed, while in a few others an understanding of elementary accounting principles is taken for granted.

Much new material, including new solutions for old problems as well as solutions for new problems, is introduced throughout the book. Among these additions are accounting, financial, and corporate-integration controls that now are far more important than formerly. In earnings control, the discussion goes beyond the history of judicial and administrative thought and centers on inducing reinvestments and new investments. Economic analysis of the relationship between private investments and reasonable returns (or reasonable depreciation allowances) is emphasized. And, because they may before long come in for either more regulatory action or more economic study, continuous, cyclical, and marginal-cost controls of earnings are examined. Radio broadcasting, presenting socially important problems of service control, is discussed in one chapter. Opportunities for private price fixing are summed up. Discriminatory pricing, a primary characteristic of public utility rates that usually is not understood by the regulators, is explained in several chapters; elasticity of demand, changes in demand, and marginal-cost behavior are the main means of economic analysis here. Finally, public management, growing more significant as federal production of electricity expands rapidly and posing special problems of social control and economic analysis, is given a large amount of space.

Trying to hold the book to reasonable size, I omitted or gave only brief attention to topics and problems that may seem important, even vital, to some scholars and policy makers. Yet my choices are based, I hope, more on reason than on convenience. Nor can I always give explicit, final answers to regulatory and managerial problems. I do not attempt to define conclusively the reasonable earnings, reasonable investments, reasonable output rules, or reasonable price structures. For although the conditions of production are examined, the consequences of alternative policies considered, and the reasonable limits of action narrowed down, firmly fixed but still reasonable solutions often cannot be deduced from them. In a democratic environment the meaning of reasonableness is not completely relative, nor can it be determined for all times.

Writing in the social climate of the 1940's, I try to show how the general welfare is served by public regulation of private utility businesses. The case for public regulation is supported by the accomplishments of competent commissions. Yet, as an underlying condition of economic analysis, I do not conceive a wise regulatory policy to be something altogether separate from the money values of private business: it is controlled in part by the capitalistic rules under which the companies are managed. To realize maintenance, improvement, or expansion of services, commissions must recognize the private interest in profits and hold out some dollar inducements to the money-minded investors. Commissioners may deplore the acquisitiveness of private firms that already enjoy special public privileges, but they cannot afford to concentrate exclusively on reduction of prices and revenue. To be realistic, an examination of any current regulation must be made in a social context of private property, private investments, and private management.

I am not certain that public production of utility services results in better social effects than does public regulation of private companies. According to my social values, there is nothing wrong with the general idea of public ownership in a democratic society; in fact, I have a personal preference for public production even when its technical efficiency is somewhat below that of private production. And I should welcome more public production, particularly in the radio and electric industries. Yet I do not see factual evidence that under the same market and technical conditions every public undertaking is economically or socially superior to all regulated private production. While I observe that some public enterprises achieve more social efficiency than do private firms, I also find the reverse to be true. Lacking, therefore, the unyielding convictions of a true partisan, I fail to make an easy, absolute choice between public and private enterprise.

Going far back in my experiences I know that I owe a greater intellectual debt than I can ever record or repay to my colleagues, former teachers, and students. My heaviest current obligations are to several scholars who read parts of the manuscript and gave me valuable suggestions that I tried to use: Dr. Howard R. Bowen, Mr. Asel R. Colbert, Professor Clarence H. Danhof, Dr. J. Rhoads Foster, Professor Robert L. Hale, Professor C. E. McNeill, and Professor D. F. Pegrum. And I owe a large debt to my wife, whose encouragement has made my work possible.

Detroit, Michigan E. T.
January, 1947

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ECONOMICS OF PUBLIC UTILITIES

Chapter 1

The Legal Concept of a Public Utility

IN OUR country a distinctive legal category of industry exists. This kind of industry is called a public utility. In practice a public utility firm is readily distinguished by the limitations that governments put on its freedom—the restrictions on the company's discretionary treatment of buyers. But the restrictions are not without compensation, for utility companies are more likely to have exclusive markets for their commodities than the companies that do not have such a status. Sometimes these monopolies are created by the public authorities as a consequence of the noncompetitive or imperfectly competitive nature of the utility industries; in other instances the companies themselves, consolidating and merging independent companies, create them. Being monopolies, these companies are subject to public regulation of their accounting, finances, earnings, prices, and service policies. Most of the regulatory action is directed toward prescriptions of reasonable earnings and prices. Neither the sellers nor the buyers obtain the prices that please them most; the sellers are denied full monopoly prices, and the buyers cannot insist on such low prices that the sellers cannot survive. Output controls are used alongside the price controls. A utility company is required, for instance, to serve all buyers indiscriminately at the prescribed prices. Denied free exercise of its monopolistic powers, a utility company is expected to serve up to the limit of its plant capacity, to take customers as they come, and to sell service at reasonable prices.

Kinds of public utility companies and their special duties can be readily enumerated. But it is not so easy to explain why some kinds of companies are public utilities while others are not. Such terms as "public utility" and "public interest" do not have, in themselves, any self-explanatory meaning; they are simply a convenient legal nomenclature, though jurists and legislators sometimes use the phrase "affected with a public interest" as if they are explaining the reason for the public utility status of a company or industry.[1] * There is no exact, determinative differentia-

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* Superscripts throughout the volume indicate references listed separately for each chapter beginning on page 803.

tion between utility and nonutility companies. Scientific workmanship and dispassionate reasoning are not traits of the men who shape the development of public utility regulation. Lawmakers and judges are influenced by a social environment in which custom and human judgment, instead of stern objectivity, are the guiding forces. Behind the public utility concept, then, is a reasonable, common-sense distinction between companies that do and do not deserve a special kind of public regulation. Regulation is sanctioned when a further breach in the solid front of the traditionally private enterprise seems tolerable. Since the legal reasoning is not based exclusively on demand, cost, competitive, and other economic differences between companies, the economist does not find his kind of distinction between utility and nonutility companies. He finds a social evaluation of private industries, a somewhat elusive distinction between utility and nonutility industries that is based more on the managerial behavior and the social significance of the industries than on the technical characteristics of utility markets and services.

ORIGINS OF THE CONCEPT

The public utility concept is a modern legal creation, though it has some historical antecedents. In a sense any past public control of private business is such an antecedent; societies of all kinds govern individual behavior in the interest of what is conceived to be the general welfare. The "just" prices of medieval times are prior examples of social controls of business. Like the reasonable prices of public utility service, the just prices were ethically controlled prices; they were measures of what a seller ought to get rather than what the market allowed him to get. Another remote antecedent of the public utility concept was the "common calling" about five centuries ago in England.[2] In the fourteenth and fifteenth centuries the list of "common" or "public" occupations included those of innkeepers, ferrymen, carriers, barbers, surgeons, brewers, bakers, and many others who dealt with the public.* Engaged in a common employment, a person had special obligations that were not attached to private employments—particularly the duty to serve all who came for service. Yet, as we know it today in the United States, the idea of a public utility has recent origins and is distinctive; it is a peculiar product of modern technology and modern democratic life.

The Liberal Tradition. The concept of a public utility evolved in a social environment that was averse to public control of private business. Development of utility regulation began during the era of economic and political liberalism which was rooted philosophically in a rational and orderly system of nature. Management of economic activity commonly was in private hands, and market-place competition between many sellers was considered the best form of private control. This individualistic business and social life, unimpeded by government regulation, was expected to provide the greatest economic expansion and the maximum economic welfare. In this social framework, where public utility regulation struggled first to get a meager existence and later to achieve a respectable effectiveness in some places, the individual was taken as he was; he was assumed to be capable of choosing between alternative objectives and alternative means of producing, pricing, and consuming goods and services. This individual, emancipated from political and social controls, had much freedom to choose how he would produce, distribute, and consume economic goods.

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* A common calling was explained primarily by the conduct of the business; a person who practiced such a calling, as distinguished from a private calling, sought public patronage.[3] In American law, on the other hand, the occupations of retailers, professional people, and craftsmen were considered private employments.[4] Only a few industries other than common carriers were singled out for public price and service controls.

Standing generally for the freedom of private enterprise, the old economic liberalism was based necessarily on the freedom of property and contract. Unless men were free to own and use property and were able to negotiate contracts easily, a freedom of private enterprise obviously was impossible. Following the natural-rights philosophy, liberalism put the protection of private property ahead of all political objectives. But an economic equality for individuals was not an objective of the system; one man or company could acquire more property than other men or companies. And after the modern corporation developed, the social system shifted farther away from the democratization of property. Nor were the liberals of the eighteenth and nineteenth centuries commonly concerned with a conservation of natural resources, or social control of land uses. The farmer worked out his own patterns of land uses; oil and gas wells were drilled freely; forests were stripped; real estate men planned the shapes of American cities; industrial expansion was managed by private companies. Expansion of the economic activity of the country was the primary objective. And the prospective profits of individuals and corporations determined the limits of the expansion. Growing up in this environment, public utility regulation was a small cross current in the general economic life of the nation.

This old and now decadent liberalism, one primarily for property owners and producers, also had its economic theory which was ably and even fervently presented by Adam Smith in his *Wealth of Nations*. In part the economic reasoning of Adam Smith was deterministic—laborers and commodities gravitated to the "best" markets so that prices were at or near their "natural" levels. But Smith, who opposed governmental restrictions of trade, added his own concept of the right kind of economic system. His system contained both moral and market-place controls of economic life. Economic and political liberty for persons and business firms was a necessary condition of social welfare; governmental controls of social relations, especially the restrictions of business enterprise, were adjudged to be undesirable, evil interferences with the natural course of economic life. Let a man do as he pleased with his property. Grant him a free choice of an occupation, allow him unimpeded access to any kind of business, and give him freedom to buy and to hire as cheaply as possible. In this way each man can make the best use of his natural aptitudes. Restrict governmental functions to such activities as the defense of the nation, banking and interest rates, public education and public works, and some administration of justice. Do these things, and the fullest possible well-being of society can be achieved. These were some of the liberal tenets of Smith's economic system. And after Smith came the classic and neoclassic writers who reasoned in a deterministic and narrowly scientific manner and who gave most attention to the business firm and the market place. Forsaking the social evaluations of Adam Smith, they established a nonmoral tradition for economic reasoning, a tradition that only recently began to break down.

Judged by a century and a half of Anglo-American economic reasoning, the most essential condition of economic liberalism was competition. Economists generally assumed a condition of perfect or pure competition of sellers and buyers, and a condition of perfect or nearly perfect mobility of economic resources. This ideal system functioned automatically. If one seller among many sellers raised his price above the prevailing price, he did not make any sales; sellers did not have opportunities to exploit buyers. Similarly, if an employer tried to exploit his laborers by pressing down their wages, other employers, searching for profits, took the laborers away from the exploiter. And as long as the movement of economic resources was perfectly mobile, labor and capital and land were transferred from profitless to profitable locations, and from profitable to still more profitable locations. When these transfers of resources were perfectly and wisely made, each unit of a resource was put to its best economic use, and the returns at the margins of resource use were the same for all kinds and all locations of resources. If a liberal economic system actually functioned in this perfect manner, the individual was beaten at his money-making game and was compelled, even against his wishes, to serve the interests of society. A divine halo, created by Adam Smith and enjoyed by sanctified business, was put on the self-regulating system: an "invisible hand" directed the individual enterpriser toward desirable social ends no matter how much he worked toward selfish ends.

Modifications of Liberalism. Competition did not prove to be so perfect as economists assumed that it was. Competition in business life began to disappear when agriculture became less important in the total economic activity, and when technical changes and corporate organizations concentrated the control of industrial production. Competition was whittled down, too, by financiers who used various corporate devices to bring rival companies under common control, and by business managers who were wise enough to take up the technological changes that offered economies of large-scale production. And the increasing industrialization, which was marked by large investments in durable plants, reduced the mobility of resources. Seeing these nonliberal conditions of the economic society and experiencing the exploitation of powerful or even monopolistic sellers, the rural and urban masses began to criticize the private price, service, employment, and financial standards.

Among utility companies in the United States, railroad companies experienced the first moderate revisions of the liberal tradition. When the railroad industry was new, the companies were encouraged to expand freely throughout the country. They received land grants from the federal and state governments, the voters gave them tax exemptions and public funds, and their securities were sold to the towns and persons to which they brought transportation service. Yet, even though the legislatures and voters helped the struggling railroad companies, they did not always get low rates. And they did not experience much competition between railroad companies. Railroading never was destined to be a competitive business in the same degree, for instance, that farming was. There never were so many companies serving every hamlet and city that competition controlled the freight rates. Often only one and never more than a few railroads served each town or area. Consequently most of the railroads operated under monopolistic or imperfectly competitive conditions. And the companies took advantage of their pricing situations, exploiting some of the people and towns from which financial aid was obtained. Being built ahead of the demand for railroad service and needing earnings, the railroad systems resorted to discriminatory and noncompetitive pricing, and forgot the promises of their promoters to the populace.

The first strong challenge to the private status of railroad companies came during the depression of the seventies. An accumulation of grievances against the railroads, abetted particularly by the deflation of agricultural prices, stimulated a nation-wide movement for regulation. Led by the Granges (the Patrons of Husbandry), the development of railroad regulation began in the Middle West and spread through much of the country. Strong, or ostensibly strong, commissions were set up in many states. Most of these were ineffective. But their ineffectiveness was not an important factor in the evolution of public utility regulation, for both the state and federal governments extended regulation, undaunted by the early difficulties with it. Granger regulation of railroad companies was the first significant departure from the liberal standard of social organization; it was a small change that was enlarged later into intensive railroad regulation and other utility regulation.

The public utility status of the railroad industry served as a model for further expansion of public utility regulation. Before the nineteenth century closed, one industry after another was classed as a public utility and subjected to regulation. First the cities and later the state legislatures applied regulation to urban transportation, water, gas, electric, and telephone companies—the kind of firms that are discussed in this book. But the list of public utilities grew slowly; even when many innovations in American government started after 1930, only a few additions were made to the list. The legal concept of a public utility is not rigid and frozen for all time, but neither is it so pliable that numerous industries are given public utility status and set apart from the traditionally private business of American economic life.

LEGAL AND ECONOMIC VIEWS

A list of public utility industries can be compiled easily. But the criteria of a public utility are not so evident. A utility company usually has monopolistic control or a large measure of output control in a market area. Yet something more than monopolistic or noncompetitive control of prices and service is characteristic of these companies. If a noncompetitive market situation is the primary characteristic of a public utility, many industries that now are beyond the control of state or federal commissions can be given a public utility status. Another test of public utility status, which appears commonly in legal discussions, is the indispensability of the service. But how can an indispensable service be distinguished from a dispensable service? Some nonutility services, in fact, seem to be quite as indispensable as utility services. Yet, even if the criteria of public utility status are elusive, one fact is undeniable: the legislatures and courts do make decisions whether or not to classify industries as public utilities. And these decisions, particularly those of the Supreme Court, are the work of intelligent men who are not inclined to irresponsible action. Surely the public utility concept is a sensible idea rather than a standard that is used in an arbitrary manner.

The Government Privilege Basis. Some persons see an explanation of public utility status in the special public privileges that governments grant to the companies. Utility firms customarily are given the right of eminent domain; they can acquire the property of other persons or companies by the same condemnation proceedings that the governments use. In addition they hold rights to occupy a market and to use such public property as streets and highways. When cities give to private companies rights to use public property or to occupy markets, the grants are called "franchises"; if a commission gives the market privileges, the grants commonly are called "certificates of convenience and necessity." Most utility companies can be identified, to be sure, by the privileges that they receive from city governments and state or federal commissions. But these privileges do not explain the public utility status of companies. Rather, the privileges are a consequence of the status. Since a company is adjudged a public utility company, it receives the right of eminent domain, the right to occupy a market, and the right to use public property.

Some jurists and regulators once justified public control by saying that the company or industry performed a governmental function. When railroad regulation began to develop after the Civil War and was approved by the Supreme Court in 1877,[5] this was one explanation of public regulation of a formerly private business.[6] If the federal government wanted settlers on the prairies and in the Rocky Mountain states, it could provide transportation facilities either by encouraging private investments in railroads or by building government railroads. Likewise, when a town was determined to have central water service and a transportation system, it could have them, even if private capital was not available, by making public investments. But this was scarcely a basic explanation of the public utility status of railroad, water, electric, and other companies. Governments, to be sure, build and operate public utility systems. Some state governments also sell liquor, though they do not classify the private distribution of liquor as a public utility business. Public production of utility service is not the same thing as public regulation of private companies; and the right of public production does not clearly explain the right to regulate the private firms. At least the public utility concept cannot be intelligibly explained in this manner until government functions are separated distinctly from private enterprise functions.

A Reasonable Evaluation. To obtain an understanding of the public utility concept, we need to consider the general attitudes of the Supreme Court toward social controls of business. This court, following the tradition of the common law, tries to maintain the liberal principles that are so evident in our Constitution. Private rights, obviously expressed in the Fourteenth Amendment which forbids the taking of "life, liberty, or property without due process of law," are uppermost in the Court's thinking. But the Court's defense of private enterprise does not blind it to all public consequences of private property and contractual rights. At times the public welfare seems to be served better by social control of individuals and private companies than by unrestricted private enterprise. Some public control of private business is tolerable within the common-law framework of American justice. Even though the traditional common law is dominantly individualistic, it allows some governmental control of individual conduct. Jurists, as well as economists, know that a monopolist (in the relative and traditional sense he is a seller who controls the supply and price of a commodity) interferes with the free functioning of a liberal economic system. When the past practices of sellers are clearly exploitive and when government regulation promises important benefits for the populace, courts usually approve legislative controls of private businesses.

The legal concept of a monopoly is not the same as that of the economist.[7] In legal thought the concept of a monopoly is a standard of evaluation by which legislators and jurists determine whether certain business practices do or do not serve the public interest. American legal standards do not call for governmental creation of purely competitive markets in which no seller has any perceptible control of the prices. Even when individual sellers do have some control of market prices and output policies, the public welfare can be maintained without public regulation. Neither legislators nor courts approve public regulation of prices merely because sellers are making more than purely competitive returns. Yet they do not tolerate all kinds of pricing conditions; some monopolies are subjected to public regulation because the consumers seem to need protection. If prices and service standards are controlled by acquisitive managers rather than by competition and if important public interests are impaired, the company or industry is adjudged a fit subject for public regulation. The legal idea of a monopoly is an ethical concept. And the behavior of the private company or industry is the important factor that must be evaluated as good or bad social behavior, even if shadowy legal language is used.

The "necessity" of public utility service is another means of evaluation, another dimension by which the rightness or wrongness of public regulation is judged. Apparently a necessary commodity—as well as the necessity of regulation—is measured, in part, by the number of persons who are affected. The evil of monopolization evidently calls for public action when a large part of the populace is at the mercy of an acquisitive company. But when only a small part of the populace is directly affected by the company's practices, the monopoly may not be judged "bad" and be turned over to regulatory authorities. Water, electric, telephone, gas, railway, and other companies are subjected to regulation; but the sulphur companies retain their private status, even though only two sulphur companies control the American market. And the meaning of necessity, like the meaning of so much legal language of public utility regulation, is determined by the jurist who must devise social evaluations. A jurist, trying to act the part of a reasonable man as he reviews legislative action and classifies this or that industry as a public utility, is not always able to see a socially necessary service where many other persons see it. Furthermore, the jurist, who commonly is anxious to protect private property and to preserve private enterprise, is more likely to restrain than to encourage the expansion of public utility regulation.

Most economists, following the traditional and "scientific" line of economic thought, commonly prefer a nonmoral approach as they study monopoly practices.* Being indifferent generally to the social effects of monopolization, they do not examine the "necessity" of a monopolist's products. Instead they analyze the pricing and output effects of a seller's market control. Economists demonstrate how individual sellers or a collusive group of sellers can maximize their profits. Price discrimination, another characteristic of noncompetitive or monopolistic selling, is described. And distinctions are made between different degrees or cases of market control—a range of distinctions that extends from pure or perfect competition to a pure monopoly. An economic study of market control is a matter-of-fact analysis, a study of pricing policies as businessmen use them rather than as they ought to be. The economist describes a seller's exploitation of his economic power; the politician and jurist make social evaluations of the exploitive practices. The economist usually does not choose a public policy of price control; the legislator and jurist have a public responsibility to shape the tolerable limits of monopolization, and to choose between desirable and undesirable practices of private companies.

JUDICIAL OPINIONS

In this country the Supreme Court is the final authority on what is and what is not a public utility. In the first place, a legislative body—a city council, a state legislature, or Congress—decides whether the public welfare can be improved by subjecting an industry to public utility regulation. Voters express strong feelings against a single company or a whole industry; politicians, desiring to be elected to public offices, promise to control the private firms; and the legislative bodies investigate the behavior of the industry and enact regulatory legislation. Deciding these cases, the Supreme Court considers the evidence that is peculiar to each case. And it reviews the judicial decisions that are given for earlier and similar cases.

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* Other economists, particularly the "institutionalists," do not renounce ethical thought and refuse to make social evaluations. Some of them go further and break completely with the common modes of economic thinking; they abandon generalized economic theory in favor of history, politics, customs, law, and social psychology.

In public utility cases, as in other matters, the Supreme Court relies on the simple rule of analogy. This rule, which also is called the "rule of precedent," makes past Court decisions the basis for future decisions. If one kind of service is classed as a public utility service, this designation is likely to be given to a similar kind of service in a subsequent decision. Reliance on the analogy rule limits the vision of the Court, and strains judicial reasoning in some cases. The railroad or common carrier, for instance, is a historical model by which the public utility status of other industries is measured.[8] But the common carrier does not have the same characteristics as an electric company or grain elevator; using the common carrier or some other industry as a bench mark for the public utility concept, the courts can distort the expansion of regulation. Or an earlier decision can be so freely interpreted that nearly any kind of business can be called a public utility. Some years ago the Supreme Court decided, for example, that the fire insurance business in Kansas was a public utility industry. This decision seemed to carry the public utility concept far past its ordinary limits. Alarmed by the apparent scope of the decision, Justice Lamar, who wrote the dissenting opinion of the German Alliance case and was supported by two other justices, thought that the fire insurance decision opened the way for price and service regulation of innumerable industries.[9]

The analogy rule simplifies and gives order to the work of the Supreme Court, which, taking account of preceding decisions and fixing lines of habitual action, can escape extensive and challenging reasoning as each new case is presented. Lacking the precedent rule, the judicial process always is unsettled. To protect itself against the appeals of numerous cases, the Supreme Court makes its past decisions the basis of settlement of many conflicts. And it gives order and historical continuity to the court's decisions. The rule is a convenience of judicial review. As John R. Commons says,* "It is a doctrine of logical consistency and equality of treatment." [10] But the Supreme Court is not bound irrevocably to its past decisions; the rule of precedent is not an absolute standard of judicial review. From time to time the Supreme Court sets aside an old "line" of cases, and starts new judicial reasoning on a question.

Munn v. Illinois. Just before the Supreme Court decided that railroads were "affected with the public interest" [11] and several years before a water company was given the same legal status,[12] it decided the Munn case.[13] This decision was the first significant pronouncement of the Supreme

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* Quoted by permission of The Macmillan Company, New York, publishers, from *Institutional Economics*, p. 705.

Court on the public utility concept. After Munn and Scott had operated a grain elevator business in Chicago for about eight years, the state of Illinois, acting in the spirit of the Granger period, passed a law that regulated the grain storage rates of Chicago elevators. Grain elevator operators were treated as public warehousemen: maximum rates for grain storage were prescribed by statute and, as conditions of operation, each warehouse was required to obtain a license and to post a bond. Munn and Scott, believing they had a private business, contested the law on the grounds that it constituted state regulation of interstate commerce, and that they were deprived of property without due process of law.

The pricing practices of grain storage companies and the concentrated control of the grain storage business in Chicago influenced the decision of the Court. In 1874 fourteen grain storage plants operated in Chicago, and they were controlled by nine companies. These nine firms agreed from year to year on grain storage rates, and had important economic effects on the Midwestern grain industry. At this time Chicago was an important grain center; grain movements from seven or eight Midwestern states converged there, and then moved to eastern and foreign markets. Consequently a few grain elevator firms in Chicago held a market position in which they could charge exploitive storage fees and affect the welfare of many farmers and villages. This economic position of the firms was recognized by the Court when it said,

> They stand, to use . . . the language of their counsel, in the very "gateway of commerce," and take toll from all who pass. Their business most certainly "tends to a common charge, and is become a thing of public interest and use."[14]

The Court not only observed the bottleneck position of the Chicago grain trade, but also recognized the largeness of the trade. Seeing the noncompetitive pricing policy of the grain elevator firms and the growing importance of Chicago grain storage to Midwestern farmers, the Court said,

> . . . that during the twenty years in which this peculiar business had been assuming its present "immense proportions," something had occurred which led the whole body of the people to suppose that remedies such as are usually employed to prevent abuses by virtual monopolies might not be inappropriate here.
>
> . . . It is conceded that the business is one of recent origin, that its growth has been rapid, and that it is already of great importance. And it must also be conceded that it is a business in which the whole public has a direct and positive interest. It presents, therefore, a case for the application of a long known and well established principle in social science, and this statute simply extends the law so as to meet this new development of commercial progress.[15]

This majority opinion, which so completely upheld the Illinois regulations, was not decided by the precedent rule. Neither a railroad nor any other kind of utility enterprise afforded a parallel case by which the public utility status of grain elevators could be explained. The Supreme Court had to do some new judicial thinking in the Munn case. Chief Justice Waite, writer of the majority opinion, said that it was not ". . . a matter of any moment that no precedent can be found for a statute precisely like this." But the majority did take account of an essay that was written by Lord Chief Justice Hale of England two centuries before.[16] This essay, which was introduced by the counsel for Munn and Scott because the earlier common law seemed to support their argument, distinguished between public and private wharves. It was quoted extensively in the opinion. Influenced at least by the language if not by the reasoning of Lord Hale's opinion, Chief Justice Waite said,

> When, therefore, one devotes his property to a use in which the public has an interest, he, in effect, grants to the public an interest in that use, and must submit to be controlled by the public for the common good. . . .[17]

The Munn decision, which placed grain elevators among the public utility enterprises, gave broad scope to the public utility concept. The grain elevator business did not receive, like the railroads, special privileges from the state. As a reading of the opinion demonstrates and as Commons observes, the Court introduced a new principle of law in this decision. Public price regulation was based on *economic conditions,* not on a special grant of sovereignty such as a franchise or the right of eminent domain.[18] The economic power of Munn and Scott, particularly their strategic position in the Midwestern grain trade, was the reason for public price control. Because Munn and Scott had this large measure of economic power, a limitation was put on their freedom to use property rights as they dealt with many defenseless buyers. This decision recognized for the first time, as Commons asserts,* that the ". . . liberty of private property meant also the economic power of private property." [19]

Justice Field, who was called by Roscoe Pound [20] a "prophet of a belated individualism," wrote the dissenting opinion of the Munn case, and was supported by Justice Strong. He argued that regulation of large grain elevators was dependent on the existence (or the implied existence) of a government franchise. Since such a privilege was not granted to Munn and Scott, he could find no basis for the Court's decision. Nor could he believe, according to his narrow and puritanical interpretation of the facts, that the grain elevator business was anything but a private enterprise. Arguing for a factual and conservative treatment of the case, he said, "There is no magic in the language, though used by a constitutional convention, which can change a private business into a public one. . . ."[21]

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* Quoted by permission of The Macmillan Company, New York, publishers, from *Legal Foundations of Capitalism,* p. 32.

The views of Justice Field were elaborated in a later dissenting opinion about grain elevator regulation.[22] Three dissenters from the Budd decision identified two kinds of monopolies: one of law, and one of fact. According to these jurists' views, a monopoly of law was a consequence of private privilege, and was subject to regulation. But the idea of a monopoly of fact involved some strange legal reasoning. Economists will be interested to know that a monopoly of fact was judged to be ". . . one which any individual can break." But how could "any individual" break such a monopoly? The dissenting justices offered a simple solution: construction of more elevators when the elevator business was profitable. They said that ". . . the field is open for all . . . the competition that may be desired."

Brass v. North Dakota. A further extension of the public utility concept was realized in the Brass case of 1894, which concerned the regulation of grain elevators in North Dakota.[23] Trying to protect wheat farmers against elevator owners, the North Dakota legislature passed a law fixing the maximum rates for grain storage. Only 600 elevators were in operation in the whole state, and they were controlled by 125 different owners. Even though the elevator owners did not have so much concentrated economic power as the owners of Chicago elevators, the majority of the Supreme Court supported the statute.

Since the conditions of grain storage were not alike in North Dakota and Chicago, the Brass case was not decided exactly according to the reasoning of the Munn decision. The noncompetitive practices of the Chicago storage companies were important factors in the Munn case, but the Court did not comment on the noncompetitive behavior of the Dakota elevator owners. Yet the elevator business was not very competitive in each North Dakota town. While six hundred elevators were operated in North Dakota at this time, all of them were not accessible to each North Dakota farmer. In a single town a farmer usually had only two or three elevators to choose from. That was a distinctly limited choice. Even if the investment .in each elevator was small, no more than two or three or possibly four elevators were built in a rural town. When only a few served a market, collusion rather than competition of the owners could control the local storage rates.

The Court passed over these obvious pricing conditions. To determine the public-interest status of Dakota elevators, the Court recognized that the size of the elevator and the volume of business were important.

But the judgment of the North Dakota legislature was the most important factor in the Brass case. Since the North Dakota legislature obviously sought to protect the state's farmers, the Supreme Court approved the regulation of grain storage rates. Judge Shiras said, ". . . we have no right to revise the wisdom or expediency of the law. . . ." and ". . . we would not be justified in imputing an improper exercise of discretion to the legislature of North Dakota." [24] So the decision of the Munn case was reaffirmed; the legislators were free to exercise their prerogatives as they assigned a public utility status to industries.

The German Alliance Case. When the Supreme Court supported the Kansas regulations of fire insurance rates in 1914, another extension of the public utility concept was made.[25] Justice McKenna, contending that the public utility concept was flexible, argued "against that conservatism of the mind, which puts to question every new act of regulating legislation and regards the legislation invalid or dangerous until it has become familiar. . . ." [26] The doctrine of precedent could not be applied in this case, for other utility industries were not analogous to the fire insurance business in rural Kansas. So Justice McKenna reasoned, as the Court reasoned several decades before in the Munn case, ". . . that a business, by circumstances and its nature, may arise from private to be of public concern. . . ." Lacking a precedent for its decision, the Court found a basis for its reasoning in the public importance of fire insurance.

Since insurance companies "create a fund of assurance and credit," the Court decided that they possess "great power" and may be "charged with great responsibility." Observing the widespread protection of many persons' property against fire risks, the Court found a quality that gave the fire insurance business ". . . a reach of influence and consequence beyond and different from that of the ordinary businesses of the commercial world. . . ." Consequently fire insurance was considered "practically a necessity to business activity and enterprise."

In the German Alliance decision the Supreme Court used a broad concept of public utility status. Even the Munn decision did not carry public regulation so far into the common sphere of private business as was done by the German Alliance decision. The Court said nothing about a "virtual monopoly" of the fire insurance business, though the number of fire insurance companies in Kansas was small enough to permit collusive pricing. And fire insurance was called "practically a necessity" rather than an indispensable commodity.* When no attention was given to exploitive pricing and when the product was not classed as a primary necessity, the customary legal characteristics of a public utility were left out of account. Nor did the Court try to find any similarity between the fire insurance business and railroad, electric, and other utility businesses. If the German Alliance decision, indeed, were interpreted literally and closely followed, many businesses could be subjected to utility regulation. That was the argument of the dissenter, Justice Lamar, whose opinion was concurred in by Chief Justice White and Justice Van Devanter: if the price provisions of fire insurance contracts were regulated, ". . . then the price of everything within the circle of business transactions can be regulated." [28] But the German Alliance decision did not become a broadly interpreted precedent for later decisions. Until the thirties, in fact, a narrow view of the public utility concept was apparent in Supreme Court decisions.

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* In 1931 the Supreme Court approved regulation of insurance agents' commissions.[27]

The Wolff Packing Company Case. When the state of Kansas undertook extensive controls of commodity prices and wage rates after the First World War, the Supreme Court held that the statute was unconstitutional. The decision of the Court was given in the Wolff Packing case of 1923.[29] Enacting a statute in 1920, the Kansas legislature declared that the manufacture of food and clothing, production of all fuels, transportation of these products, and the ordinary public utility businesses were affected with the public interest. A Court of Industrial Relations was created, and was given authority to administer the statute. Going far beyond the usual limits of public utility regulation, the state of Kansas wanted to regulate many industries that always were private businesses.

Chief Justice Taft, endeavoring to define the public-interest concept, divided industries into three classes. One kind of enterprise, such as a railroad or electric company, received a "public grant of privileges" whereby a duty to render public service was "expressly or impliedly" imposed. Another class included such historic occupations as those of innkeeper and cab driver which were subject, ever since their earlier existence under the common law, to special duties. Finally, in the third class were "businesses which, though not public in their inception, may be fairly said to have risen to be such, and have become subject in consequence to some government regulation." This categorical summation of the public-interest enterprises did not explain anything; certainly it did not explain why the public-interest status was imposed on a few businesses. The first group was based on the mistaken belief, once emphasized so strongly by the dissenters in the grain elevator cases, that a franchise or the right of eminent domain was the legal basis for public utility regulation. The second classification was little more than a statement of historical facts. And the third group contained simply the industries that already were public utility industries. The whole classification, in fact, was scarcely more than a tautology.

Later in his opinion Chief Justice Taft says, "It is very difficult . . . to lay down a working rule by which readily to determine when a business has become 'clothed with a public interest.'"[30] At one place in the opinion the "peculiarly close relation" between the public and the seller is noted. And in another place Chief Justice Taft suggests that "intimate" regulation is supportable when the public is "peculiarly dependent upon a particular business." The reasoning of the Court seems to be summed up in the observation that there is an ". . . indispensable nature of the service and the exorbitant charges and arbitrary control to which the public might be subjected without regulation." None of these characteristics were found in the food, clothing, or coal industries of Kansas.* These industries were not controlled by monopolists; nor did the Court see a peculiarly close relationship between buyers and sellers. Thus the Court retreated from the opinion of the German Alliance Insurance case. Fire insurance was "practically a necessity" and monopoly pricing of fire insurance companies was not considered; but the Wolff Packing opinion required evidence of indispensable service and exorbitant charges before a business could be declared a public utility.

The Tyson and Ribnik Cases. Throughout the twenties the Supreme Court refused to broaden the public utility concept. Trying to control the pricing practices of ticket scalpers, the state of New York enacted a law fixing the brokerage charges on theater tickets. In 1927 the Supreme Court, voting five to four, decided that the law was unconstitutional.[32] And when the Ribnik case was decided a year later, an extension of price control to employment agencies in New Jersey was denied.[33] In both cases the pricing practices of the sellers did not influence the reasoning of the Court. The rule of analogy was used, and the special forms of public utility regulation were confined to only a few industries.

Unlike the majority opinions, the minority opinions in the Tyson and Ribnik cases considered the conduct of the sellers and the social effects of the regulations. Justices Holmes, Sanford, and Stone wrote separate dissenting opinions in the Tyson case, and Justice Brandeis concurred in the dissents of Justices Holmes and Stone. Upholding the right of the legislature to choose regulatory policies, Justice Holmes approved control of ticket scalpers because the people of New York "say . . . they want it." He said,

> . . . to many people the superfluous is the necessary, and it seems to me that government does not go beyond its sphere in attempting to make life livable for them. I am far from saying that I think this particular law a wise and rational provision. That is not my affair. But if the people of the State of New

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* In several other cases, however, the Supreme Court approved a public interest status for stockyard companies.[31]

> York speaking by their authorized voice say that they want it, I see nothing in the Constitution of the United States to prevent their having their will.[34]

And the opinions of Justices Sanford and Stone were influenced by the monopolistic controls and extortionate prices of the ticket brokers. Writing the dissenting opinion of the Ribnik case and receiving the support of Justices Holmes and Brandeis, Justice Stone strongly criticized the anti-social practices of employment agencies. Challenging the majority's distinction between price regulation and other forms of business regulation, he could not see how a business enterprise

> . . . subject to every other form of reasonable regulation, is immune from the requirement of reasonable prices, where that requirement is the only remedy appropriate to the evils encountered. In this respect I can see no difference between a reasonable regulation of price and a reasonable regulation of the use of property, which affects its price or economic return.[35]

The New State Ice Case. Disapproving Oklahoma regulation of ice manufacturing companies, the Supreme Court again refused to broaden the public utility concept in 1932. This decision was given in the New State Ice case.[36] The majority of the Court upheld Liebmann, who did not obtain a license from the state commission before he entered the ice business. Ice manufacturing was held to be a private business. The majority of the Court found no monopoly or emergency conditions that justified public utility regulation; they believed instead that a restriction of the number of ice manufacturing companies might foster monopolies and jeopardize the interests of consumers. They also rejected the minority plea for experimental regulation, because there were "... certain essentials of liberty with which the state is not entitled to dispense in the interest of experiments."

The New State Ice case is remembered more for Justice Brandeis' dissenting opinion, which was concurred in by Justice Stone, than for the majority opinion. This opinion, which revealed Justice Brandeis' willingness to expand greatly the limits of public utility regulation, tied up social reasoning with legal thought. Challenging the old liberal tradition in legal and political thought, Justice Brandeis did not doubt that a ". . . regular supply of ice may reasonably be considered a necessary of life, comparable to that of water, gas, and electricity" in the warm climate of Oklahoma. Development of the manufactured-ice industry, he believed, led to "radical changes in habits of popular thought and living" in Oklahoma and elsewhere.

A further justification for public regulation of the ice industry, Justice Brandeis believed, was the possibility of destructive competition. Since ice companies had large amounts of fixed plant capacity and large overhead costs, the construction of additional plants could cause the managers ". . . to go to extremes in cutting prices in order to secure business." He would stop this competition and the waste of plant, since ". . . experience has taught that the financial burdens incident to unnecessary duplication of facilities are likely to bring high rates and poor service." Giving emphasis to these pricing conditions, Justice Brandeis based his case for public utility regulation on conditions of imperfect or monopolistic competition—conditions that commonly were treated by most jurists as characteristics of private business. He wanted to stop wasteful competitive practices by means of public regulation, and particularly to stop the duplication of expensive plants. Thus his objections were directed toward imperfectly competitive practices, not toward purely competitive business.

The reasoning of Justice Brandeis was influenced by the depressed economic conditions of 1932. He accepted the view that "unbridled competition" and overinvestments in productive plants were causes of business depressions. This part of the dissenting opinion did not show any extensive understanding of dynamic economic conditions; Justice Brandeis, poor fellow, did not have a chance to be a Keynesian economist. Following Lord Keynes, American economists commonly showed how the great depression of the thirties was caused primarily by a collapse of private and public investments. Revenue expectations were shortened; investment decisions were made cautiously; and the flow of investment funds declined. The trouble was a lack of investments, not overinvestments. A similar explanation of business fluctuations, which is most effectively presented by Gordon Hayes, emphasizes the oversaving of corporations and wealthy persons—the failure either to invest savings or to increase consumption expenditures.[37] In any case, an elimination of competitive business does not assure a lasting business prosperity. Perhaps more competition facilitates depression-time adjustments between business firms, though neither competitive or noncompetitive business can prevent depressions. Certainly a successful, smoothly functioning capitalism is not dependent, as some business interests (as well as Justice Brandeis) believe, on protection of companies' investment values against "unbridled competition."

Even if some of Justice Brandeis' reasoning about business cycles is superficial, his plea for experimental control of business cannot be slighted. "To stay experimentation in things social and economic," he warns his fellow justices as he argues for a flexible concept of public utility regulation, "is a grave responsibility." He is willing to use a single state, such as Oklahoma, as a laboratory to ". . . try novel social and economic experiments without risk to the rest of the country." Continuing his plea for pliable standards of judicial review, he says,

> We may strike down the statute . . . on the ground that, in our opinion, the measure is arbitrary, capricious or unreasonable. . . . But in the exercise of this high power, we must forever be on our guard, lest we erect our prejudices into legal principles. If we would guide by the light of reason, we must let our minds be bold.[38]

The Nebbia Case. In 1934, two years after its adverse decision in the New State Ice case, the Supreme Court approved the New York regulations of milk prices.[39] This was the Nebbia decision. Ignoring the precedent of the New State Ice opinion and earlier decisions, the Court, voting five to four (Justices Van Devanter, Sutherland, and Butler concurred in Justice McReynolds' dissenting opinion), broadened the limits of public price regulation. Like electricity, telephone, and other familiar utility prices, milk prices were subjected to regulation that was considered necessary for the protection of public interests. When the Court decided this case, it was as bold as Justice Brandeis wished it to be in the New State Ice case. It was marking out new limits of public control of business, giving attention to economic conditions rather than the conventional legal thoughts. The Nebbia decision, keeping judicial pace with New Deal government, is a turning point in the old economic liberalism—the old individualism of private business. Price control now can be extended beyond the familiar "public-interest" categories; it can be applied to the "sick" and disturbed industries of too much competition as well as the exploitive industries of too little competition.

The New York statute declared that the milk industry was affected with the public interest. This statute, like similar laws passed about the same time in many other states, set up a milk control board and provided control of prices and trade practices of milk producers and milk distributors. The purpose of the statute was control of competitive, not monopolistic practices. Some dairymen were members of milk producer associations that negotiated contracts with large urban milk distributors; others were not members of marketing associations, and often were forced to sell most of their milk to manufacturers of milk products. When the demand for milk decreased during the depression years of the thirties, the incomes of the independent dairymen decreased also. Then these dairymen offered milk to urban distributors at lower prices than those of milk producer associations. Both the retail and bulk prices of milk decreased. Upset by the decreases in their prices and incomes, the members of the producer associations requested state regulation of milk prices. To increase the incomes of dairymen and to prevent, as the dairymen argued, an impairment of the quality of milk and public health, the state milk board in New York raised the wholesale and retail milk prices. In Rochester, New York, a minimum retail price of 9 cents a quart was fixed. But Nebbia, the obscure Rochester grocer in the case, continued a competitive pattern of pricing, offering two quarts of milk and a loaf of bread for 18 cents.

Justice Roberts, writer of the majority opinion, admits that the ". . . dairy industry is not, in the accepted sense of the phrase, a public utility." The Court does not speak of "exorbitant charges" and a "virtual monopoly" as it does in earlier decisions. It does not even look for evidence of monopolistic practices, though the discriminatory pricing and membership restrictions of milk producer associations give convincing evidence of these practices.* The case does not present, indeed, a question of monopolistic conduct. Another kind of price-control problem is before the Court: higher prices and higher incomes for dairy farmers. Upholding the New York regulations of milk prices, the Court takes a broad view of regulation. It does not believe anything is so "peculiarly sacrosanct about the price" of a commodity that, even if the state is ". . . able to regulate other elements of manufacture or trade . . ." and can indirectly affect the commodity price, the state ". . . is incapable of directly controlling the price itself." The Court apparently does not consider the right to fix prices so distinctly private as it once was. Abandoning some of the historic restrictions of the public utility concept, the Court says,

> The phrase, "affected with a public interest" can, in the nature of things, mean no more than that an industry, for adequate reason, is subject to control for the public good. . . . [And] there can be no doubt that upon proper occasion . . . the state may regulate a business in all its aspects, including the prices to be charged for the products or commodities it sells.[40]

Using its own authoritative standards, the majority of the Court evaluates conditions in the milk industry and finds a public purpose for milk price control. The majority recognizes that ". . . unrestricted competition aggravated existing evils, and the normal law of supply and demand was insufficient to correct maladjustments detrimental to the community." It recognizes, further, that competition between milk producers can reduce milk prices until they are below the costs of milk production. Treating these effects of competition—the effects of imperfect competition instead of pure competition—as social misfortunes, the Court observes that

> If the law-making body within its sphere of government concludes that the conditions or practices in an industry make unrestricted competition an in-

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* A brief description of these monopolistic practices is presented in the next chapter.

adequate safeguard of the consumer's interests, produce waste harmful to the public, threaten ultimately to cut off the supply of a commodity needed by the public, or portend the destruction of the industry itself, appropriate statutes passed in an honest effort to correct the threatened consequences may not be set aside because the regulation adopted fixes prices reasonably deemed by the legislature to be fair to those engaged in the industry and to the consuming public.[41]

As Justice Brandeis proposed in the New State Ice case, the Supreme Court allowed protection of the prices and investment values of milk producers and milk distributors. Prior to this decision a public-interest status was imposed on an industry to protect consumers. In the Nebbia case the producer interests, instead of consumer groups, asked for and were given price-control protection against the effects of competition. The milk control boards, dominated by milk producer associations and determined to get higher incomes for dairy farmers, did not show any particular interest in consumer welfare after the Nebbia decision. Moreover, when the Supreme Court approved milk price control, it gave its support to a kind of monopolistic pricing. The pricing practices of milk producer associations were monopolistic before the case was decided and the dominant milk distributors in most American cities preferred price agreements to competitive pricing. Managerial administration of milk prices was strengthened by the Nebbia decision.

The Nebbia decision was no momentary deviation of the Court—no temporary effect of a severe economic depression on the Court's reasoning. When further cases about milk price control were presented to it, the Court did not reopen the main question—the rightness of any public control of milk prices. These later cases concerned lesser questions such as the limits of interstate and intrastate commerce in milk.[42] Deciding the Sunshine Anthracite case in 1940, the Supreme Court also approved federal control of bituminous coal prices.[43] And state regulation of the fees of employment agencies was upheld.[44] The Supreme Court, like Congress, was willing to experiment with price regulation, seeking possible ways to improve the functioning of our economic system. Trying to preserve private property values and approving the stabilization of private earnings, the Supreme Court began to support a popular means to social improvements—output restrictions and higher prices for commodities.

A Retrospective View. Making public utility decisions for seventy years, the Supreme Court did not clarify the public utility concept. In the Munn case the Court had a simple, understandable solution: let the legislatures determine the public policy of utility regulation. After the Munn doctrine was clearly forsaken by the time that the Court decided the Wolff Packing case, the criteria of a public utility were exploitive pricing and the necessity of the commodity. The Court favored free private enterprise unless the conduct of companies clearly showed a public need for regulation. Trying to protect private property and private management, the Court was unwilling to extend public utility regulation to numerous industries. Even if a few companies in an industry practiced monopoly pricing and obtained monopoly returns, they were not always classed as utility firms and subjected to regulation. The Court never clarified the meaning of an "exorbitant" price or a "necessary" service. Since the Court was making reasonable judgments of what was necessary and what was exorbitant, no precise definition of a public utility could be given. The Nebbia decision increased the obscurity of the public utility concept; this was the end, perhaps, of the concept. Although regulation traditionally was designed to protect consumers against acquisitive and powerful sellers, the Nebbia decision protected the earnings and property values of sellers who did not wish to compete with each other. Using the public-interest doctrine for different purposes, the Supreme Court allowed regulation of some monopolistic practices while other kinds of exploitation were fostered.

Chapter 2

Economic Characteristics of Public Utilities

THE ECONOMIC and legal criteria of public utility companies are not always alike. A jurist or legislator decides what new industries shall be given a public utility status; the economist, on the contrary, usually studies the characteristics of the industries that already are regulated as public utilities. The Supreme Court, working necessarily on the periphery of the public utility concept, discusses the public-interest nature of such businesses as grain elevators, fire insurance firms, employment agencies, and ice companies—the kind of businesses that are rarely subjected to public controls. On the other hand, economic discussion is confined usually to the common public utilities—the electric, gas, water, telephone, and urban transportation industries. Disliking loose statements about virtual monopolies and necessary services, the economist describes the forces that restrict the number of firms in a market. The cost behavior of public utility firms, which ordinarily is neglected in legal discussions, is an important part of the economic studies. And an analysis of the demand for utility services replaces the judicial judgment of what is and what is not a "necessary" or "indispensable" commodity.

A list of economic characteristics of public utilities can be constructed so that a differentiation can be made between utility and nonutility industries. But a black-white distinction between the regulated and unregulated industries is impossible. Sometimes the nonutility industries seem to have all or nearly all the economic characteristics of public utilities. In some nonutility industries, such as the metal or automobile or chemical industries, the output is produced by a few companies. Since only a few firms occupy many nonutility markets, the nonutility industries often are characterized by monopolistic or imperfectly competitive pricing just as utility industries are. Nor is demand behavior for utility services always distinctly different from that for many other commodities. It is not easy to discern, for instance, that utility services are less necessary than other commodities for social life. Blurred and dim outlines of public utility status, in fact, are expected; the concept is a product of judicial and legislative judgments, not the outgrowth of the objective, impersonal thinking of scholars.

THE GENERAL PRICING SITUATION

In economics the pricing cases range from a pure monopoly, where one seller has complete output and price control of a commodity within a defined market area, to purely competitive pricing, where the number of sellers is so large that no single seller has any known control of the market price. One end of this market spectrum, the purely competitive situation, bears no relation to the typical selling condition of utility-company operations. Public utilities do not experience pure or approximately pure competition, but commonly produce and sell their services under monopolistic or only nominally competitive conditions; they are located in the upper part of the rivalry spectrum where the seller has a large measure of price control, and knows it. Even if no municipality or state commission is opposed to the entrance of new firms, many utility companies still are quite certain to have monopolistic control of their separate market areas.

Monopolization does not quite cover all possible cases for the sale of public utility services. Since commissions or cities restrict the entrance of new firms into public utility markets, only one telephone, electric, gas, water, or urban transportation company usually occupies each market today. Railroad companies and intercity trucking companies, which do not have exclusive control of transportation in all towns and cities, are exceptions. But when the utility industries were new, the rivalry of companies was fairly common; two or more telephone, electric, and other kinds of companies frequently shared a market. When only two sellers sell in a market, economists call the market situation a "duopoly." And when a few sellers are rivals of each other, it is called an "oligopoly." If, as in preregulation days, two or only a few sellers control a public utility market, they can agree on such matters as prices, service standards, technological innovations, and market expansion. Agreeing on basic policies, they can act as a single seller. Or they can compete with each other. If the sellers are active rivals, the competition is imperfect, bearing only a superficial resemblance to the perfect competition of classical economics, or to the pure competition of more recent economic analysis.[1] A few competing firms, clashing directly with each other and struggling to hold or to enlarge their sales, can present a noteworthy business spectacle until the struggle ends. To some people this competition of duopolists or oligopolists seems to be the highest order of competition. Yet it falls far short of the pure or nearly pure competition of American wheat, corn, cotton, livestock, and other kinds of farmers. Even if it can be spectacular for a short time, the competition of utility firms is rightly called imperfect or limited competition; it is a competitive situation where each of the rival firms always has some administrative control of market prices.

"Natural" Monopolies. Public authorities do not believe that competition of utility companies is a reliable means of price control. They believe that the managerial interests are likely to create monopolies in public utility markets. "Natural" monopolies, they say, are common characteristics of utility industries. The term implies, of course, that the control of public utility service in a market is somehow "naturally" or inherently monopolistic, that the rivalry between unregulated companies is inevitably eliminated, and one company ultimately dominates the market which several companies once occupied. Consolidations and mergers of rival utility firms were, to be sure, common in the histories of utility industries. Yet a designation of utility industries as natural monopolies did not explain the process by which the managerial control was concentrated. Utility financiers and managers, like corporate financiers and managers in general, wished to eliminate or to control the rival firms. And other forces, too, were behind the consolidations and mergers. Technological changes, for instance, outmoded the small utility company, and afforded significant economies of large-scale production; the optimum scale of electric, telephone, and natural gas operations expanded far beyond the limits of a single town. Yet technical innovations and corporate concentrations were common in nonutility as well as utility industries.

Nor is monopolization a universal condition of utility industries. Rivalry of railroad companies with truck, water, and air transportation companies is common in many markets. Bus, street railway, and elevated or subway companies often operate in the same urban area. Seeing these facts, we must admit that some utility services still are performed under conditions of imperfect or limited competition rather than monopolization. Next, the word "natural" is deceptive. Is monopolization a "natural" condition for public utility industries, and an "unnatural" condition for nonutility industries? What is "unnatural" about the market control that two sulphur companies, for instance, exercise in this country? Since market prices can be controlled by nonutility firms as well as unregulated utility companies, the concept of a natural monopoly seems to be a fictional rather than a real characteristic of the utility industries. Perhaps, as others have observed, the notion of a natural monopoly was invented to justify exclusive markets for utility companies after their ineffectual and sometimes wasteful rivalry proved unsatisfactory to both the investor and the consumer interests.[2]

Technical Limitations of Rivalry. Since the number of plant locations often is small, the number of rival utility firms is limited. The width of a city street limits the number of street railway companies that can compete directly with each other. Narrow streets hold only one or two sets of tracks, and leave no room for competing companies; even on the thoroughfares two firms are the workable maximum number of street railways. A number of water, gas, electric, and telephone mains or conduits can be laid in a single street. But when the number of mains and conduits is large, the streets are torn up frequently; the rivalry of utility firms becomes a civic nuisance. More than one overhead line for telephone or electric service can be erected in a street or alley, though these can be congested by even a few lines. And the desirable sites for hydroelectric projects are limited; one site cannot be readily split up so that several companies can utilize the water flow.

Technical conditions of service, too, can limit the number of firms that operate in any market area. A common purpose of water service in any community is fire protection. The responsibility for fire protection usually can be imposed more easily on one company than on several companies. If several water companies serve a city, each of the rival firms may prefer domestic and commercial sales and may want to neglect the fire protection service. Urban transportation service is more completely integrated—schedules of different routes are more readily articulated, and duplications of service are more easily avoided—when a single transportation company controls the market. A better quality of service also explains the exclusive markets for electric and gas companies; continuity and uniformity of service is more fully assured as electric and gas companies grow large and pass beyond one-plant scales of operation.

In no industrial field are technical conditions of service so clearly the reasons for no competition among companies as in local telephone service. Not many years ago a Bell company and an independent company offered service in many cities. Consumers were adversely affected by the telephone competition. Each company could refuse to exchange calls with its rival, or it could delay the intersystem calls. Under these conditions a person obtained incomplete or unsatisfactory service from one company, or he bought service from both companies. Greater technical efficiency, then, was realized after more than 80 per cent of the local telephone service came under the control of the Bell system. In the case of toll telephone service, which is even more completely dominated by the Bell system, other technical benefits of concentrated control are realized. A wide and integrated network of toll lines is operated; toll calls probably are handled more quickly and more economically than if several large-sized companies offer long-distance service; and the top company in the system, the American Telephone & Telegraph Company, spends money freely on research work for long-distance service.

✓ *Economies of Plant Size.* Even if the public authorities seek to control prices and earnings with competition instead of governmental regulation, a reduction of the rival companies still can occur. The economies of large-scale plants in most utility industries lead to consolidations and mergers. Although they are evident in nearly all utility industries, these economies of large-scale operation are most common in the electric and gas industries. Some of these economies are related to technical operations of plants. As the capacity of an electric generating plant increases, investment and operating costs do not increase proportionately. Similar economies of large-scale output are available to gas companies. The average transmission and distribution costs of manufactured gas or natural gas decrease as the size of the pipe line increases. And all utility companies usually can realize other internal economies of size such as more specialization of the managerial and engineering staff, quantity purchases of materials, and a lower cost of capital.*

Another economy of size is evident particularly among gas and electric companies. This is the economy of diversified plant use, which is a result of the buyers' diversified demands for service. Large gas and electric companies usually have better "diversity factors" than small plants. To measure the diversity factor, the company first computes the maximum service demands for individual consumers or market subdivisions; one of these maximum demands can be measured as the largest 15- or 30-minute period of consumption in a month. Then the maximum demand of the whole system is computed for an equivalent period of time. Dividing the separate consumer maximums by the whole-system maximum, the company has the ratio of service diversification. When an electric firm, for instance, is small, it can draw customers who demand service at the same time of day. Since the company cannot conveniently store up an inventory of kilowatt-hours, it has much unused plant during the times when buyers do not demand service. The same condition sometimes is encountered in water, urban transportation, and telephone service; gas companies are more fortunate, for they can store a 12-hour to 24-hour supply of gas in holders or in natural gas lines. On the other hand, if the utility company is large, it can draw a collection of buyers who have more diversified demands. A large electric system can draw a mixed clientele of industrial buyers, domestic buyers with varied living habits, and commercial buyers who want electricity at different times of the day. Or a large transportation company, encountering demand peaks at different times in different localities, can move equipment from place to place and economize investment costs.

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* These economies of size are not limitless. Except in metropolitan areas where suitable plant sites are sometimes scarce, there is actually a recent trend away from the larger types of electric generating stations.[8] A study by the Federal Power Commission roughly measures the limits of large-scale economies of electricity production.[4] Managerial diseconomies, too, begin to show up in large, unwieldy companies. Becoming more inflexible in its administrative action and more infused with corporate bureaucracy as it grows, any company can experience significant diseconomies of large-scale production.

The cost economies of large-scale production often are large enough to justify unifications of companies, and to reduce the already nominal rivalry of unregulated utility companies. To describe the relations between cost economies and corporate unifications, let us use a simple diagram (Figure 1) that has different average-cost curves for different scales of plants. Suppose that each of the rival companies is operating with plant scale *A*. In a short time one or more of the managers recognizes the economies of the larger plants. If the wise manager takes advantage of his superior perception, he shifts to scale *D*. This enlargement of plant operations leads ultimately to a reduction of the firms, unless the increases in demand are so large that all firms can make a profitable shift to the *D* scale of operations.

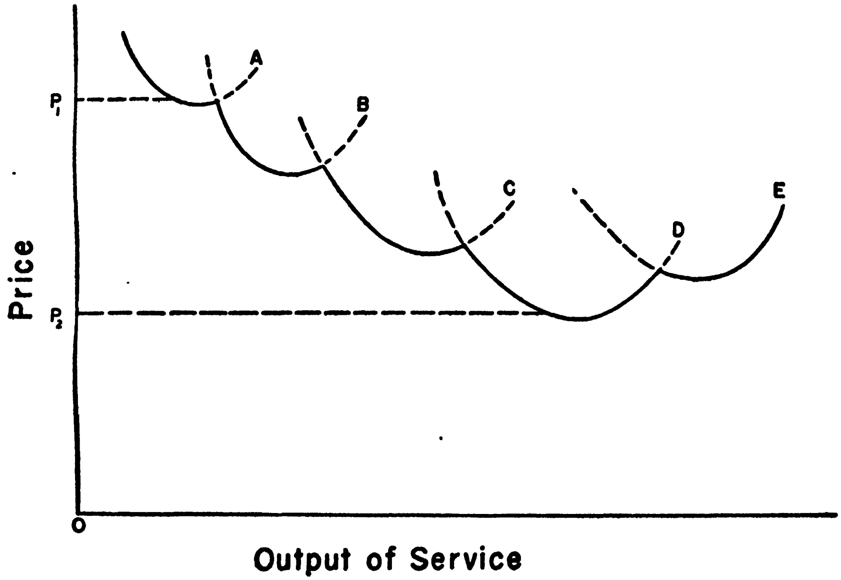

Fig. 1.

After a larger and more economical scale of operation is available, the reduction of competing firms can take place through price reductions. If one or more firms use the *D* scale and reduce prices to P_2 or less, some users of scale *A* eventually are forced to quit operations. But this was not the typical way in which some firms were eliminated. The inefficient utility companies usually were absorbed because the efficient companies purchased their plants or securities, or because holding companies bought their voting securities. Economies of electricity production hastened the consolidation, merging, and widespread holding-company control of electric companies. As the central station became an increasingly more refined and more economical means of electricity production, the small and isolated plants were acquired, sometimes for fancy prices, by the companies that had modern means of electricity production. At first the electric service of a single city was controlled by a single company; later the surrounding towns were brought into the system; and still later, when further technical innovations were available, several operating systems were welded into supersystems of interconnected plants. Preferring to buy the outmoded plants or securities of the small companies, financiers did not wait for the inefficient firms to drop out of their own accord. Knowing the economies of expanding scales of operation, financiers, wanting franchises and new markets, could afford to pay high prices for obsolete plants.

Other Conditions of Domination. As a further reason for the existence of only one or a few utility firms in any market, an aggressive company commonly wanted to dominate the market. Unifying street railway, gas, electric and telephone companies, financiers obtained more managerial control of prices as well as significant technical economies of service production. Nowhere was market domination so clearly the purpose of corporate unification as in the Bell system of telephone companies. When the basic Bell patents of the AT&T system expired in 1893 and 1894, independent telephone companies were organized in many cities. The Bell companies met their rivals with lower rates, service improvements, and refusals of toll-line connections.[5] They practiced geographic discrimination of prices: prices were reduced where competition was encountered. Yet the Bell system preferred to acquire ownership of the independent companies. It did acquire many of them, though some independent companies could not sell out to the Bell companies because their franchises prohibited acquisitions by rival companies. Other independent companies, possessing some solidarity of organization, objected strongly to the Bell domination of markets. Unable to combat the strong organization, the independents started an antitrust case; then the Bell system agreed to discontinue its purchases of competing companies. Thereafter the duplicate exchanges sometimes were eliminated by a Bell company acquisition in one place and an independent company acquisition in another city.

Patent control can limit the number of utility firms that occupy a market. Owning many patents and making large expenditures on research work, the Bell system has additional opportunities to dominate wire communication service throughout the country. After the basic telephone patents expired and could be used by independent telephone companies, the leaders of the Bell system never again let themselves be caught without effective patent control of their markets. In the words of one AT&T president, T. N. Vail, the objective of "occupying the field" was adopted. Bell Telephone Laboratories, Inc., became a vigorous and extensive research adjunct of the system; it became, perhaps, the most notable research organization in the whole country. Yet Bell research was not directed exclusively toward telephony; stating the research objective of the system, one official said that ". . . it shall maintain an active offensive in the 'no-man's land' lying between it and potentially competitive interests." * Now the system owns or holds license rights to about 17,000 patents.

GENERAL COST CHARACTERISTICS

Public utility industries have large fixed investments. They have such large investments in durable equipment that, over a period of years, their most important costs are associated with the construction and maintenance of plants. The cost of hydroelectric service, for instance, is mainly the construction cost of the dam, power generating equipment, and transmission lines. And after a natural gas line is laid and the compressor stations are installed, a natural gas company does not incur large expenses of gas transmission. A large plant investment and a low rate of capital turnover also are common in other utility industries. Consequently utility companies, like other firms with large plant investments, have slow rates of capital substitution. If they make unwise investments, they make the best of their misfortunes for a long time rather than write off the old investments and start investing anew. If a utility company has an excessive plant capacity, many years may pass before the excess is corrected by reinvestments in a smaller plant.

Providing Plant Capacity. Utility companies ordinarily have—indeed, are expected to have—sufficient plant capacity to serve all consumers who are willing to buy at the existing prices. These companies commonly have some unused plant capacity. Except for day-to-day storage of gas and reservoir storage of water, utility service is nonstorable. At some time of the day, year, or business cycle a utility firm experiences the highest demand for service; this is called the "peak demand." If companies satisfy the peak demands, as they usually do, they must plan the plant capacities in advance, making predictions about the sizes of these demands. When plant capacity plans are drawn up and investments are made, companies build plants that meet more than the experienced, historical peak demands. Extra plant capacity is provided for unforeseeable changes in the peak demands. Building beyond immediate demand conditions, utility companies often have "necessary" overinvestments in their plants.[7] The short-run overinvestments are necessary because the companies are expected to serve everyone who demands service; the firms must serve everyone regardless of the daily, annual, or cyclical variations in consumer demands.

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* Written by J. E. Otterson, who was general manager of the Western Electric Company, this declaration was part of the "four-square memorandum" of 1927.[6]

When a utility company is expanding, cost economies can be effected by enlarging plant ahead of demand increases. Compared with a plant that merely satisfies the present demands of buyers, a large plant affords cost economies that can justify the forward-looking construction and the temporary excess of plant capacity. At least a company does not invest in barely enough plant to meet the existing demand unless decreases in demand are expected, or unless the next minimum addition to the plant capacity is large relative to the anticipated increases in demand. When companies constructed large natural gas lines from Southwestern and California gas fields to distant markets, they commonly anticipated increases in demand. For some time after these lines were built, the firms had large amounts of unused plant capacity. To use part of the available gas plant, they sold an inferior service. Interruptible gas service, which was subject to a short or even 24-hour notice of withdrawal, was sold at nominal prices to industrial buyers.

Since the demands of utility consumers have significant time dimensions, there is certain to be some unused capacity of public utility plants. Having enough capacity to meet the peak demands, the companies have, of course, more than enough capacity to satisfy buyer demands at other times of the day, year, or business cycle. Electric firms commonly have idle plants during early morning hours and other times of the day; natural gas companies, selling gas for space heating as well as other purposes, have idle plants during the warm months of the year. The companies have much off-peak capacity to produce utility services. Their load factors are less than 100 per cent. (Load factor: the ratio of average sales to peak sales for any chosen period of time.) A large off-peak capacity for service production is a special pricing condition for utility service. If legislators rely on rivalry of companies to control prices, unused plant capacity during off-peak periods is one reason for instability of competition. When several firms have much off-peak capacity, a price war can be started because all companies simultaneously try to secure the limited amount of off-peak business.

Decreasing Costs. Most economists, regulators, and company managers agree on one characteristic of utility operations: utility services commonly are produced under decreasing cost conditions. When the output of utility service increases, the average unit cost of production decreases. Widely accepted, this idea of cost behavior is used to explain a number of managerial and regulatory policies. It is used, for instance, to explain the instability of competition between rival utility firms. Since a firm can reduce its average cost of operation by enlarging its output, it can offer service at a lower price and try to increase its earnings. But each of the rivals has the same opportunity to enlarge its earnings, when, anticipating additional earnings, it can offer service at lower prices. If all of them seek larger outputs and earnings in this manner and if the total demand does not increase, the earnings of all the firms are likely to decrease. Market stability is established when all the companies exhaust their opportunities to reduce the average cost of service—or when the managers agree to follow some noncompetitive policy.

The decreasing cost condition needs to be understood before much importance is attached to it. Those who speak of utility industries as decreasing cost industries usually do not explain the sense in which they use the idea of decreasing cost. Apparently they think of average cost changes when the plant capacity is fixed. If a short view of costs is taken and the existing plant is treated as a datum, it is easy to show a decreasing cost condition over a considerable range of output. This is true because some of the total costs of service, such as plant depreciation and investor returns which are familiarly known as fixed costs, do not vary with output changes. Starting with a small output from the established plant, the company has a high average cost of production because the so-called "fixed" costs are divided among only a few units of service. As the output increases, the same or nearly the same total of fixed costs is spread over more units of output and the average cost decreases. This is obvious when the off-peak service expands; this kind of service requires no additional investments in the basic plant capacity. Likewise, as the regular output expands toward the optimum output of the plant, the fixed costs become a smaller part of total costs and the average cost declines. Using a simple illustration such as Figure 2, we can see that, as the demand increases from D_1, to D_2, and even to D_3, the average cost decreases; until the output is extended beyond OQ_3, the average unit cost decreases.*

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* As an elementary economic fact, the variable-cost and marginal-cost curves start to increase before, perhaps long before, the output reaches OQ_3.

When the plant capacity is fixed and the total costs are divided by small as well as large amounts of actual output to determine the average costs of production, a condition of decreasing cost is bound to be measured. Indeed, when a durable plant is taken for granted and average costs are measured in this manner, any kind of company, either a utility or nonutility company, experiences decreasing costs of operation.

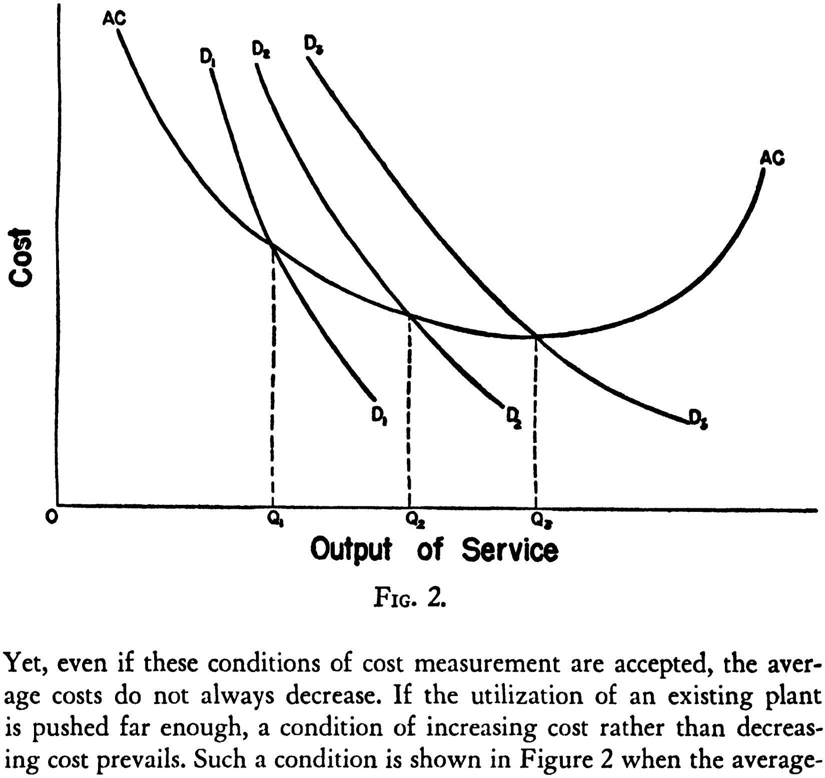

FIG. 2.

Yet, even if these conditions of cost measurement are accepted, the average costs do not always decrease. If the utilization of an existing plant is pushed far enough, a condition of increasing cost rather than decreasing cost prevails. Such a condition is shown in Figure 2 when the average-cost curve slopes upward beyond output OQ_3. A company can experience decreasing, constant, and increasing costs if the range of output variation is unrestricted.[8]

Another measure of the average-cost variations gives a different view of the decreasing and increasing costs of utility services.* In this case a long-period instead of short-period view is taken of the cost behavior. The existing plant is no longer an assumed datum; the average costs of production vary with the scales of plant—with the alternative choices of plant capacity. The average costs of production decrease or increase as the plant scales (plant capacity) are changed. It is as though a company, looking over the various sizes of plant, is computing an average cost for each distinctive choice of plant. Before the point of optimum production is reached, the average costs decrease; beyond this optimum the average costs increase. In Figure 3, which is similar to Figure 1, these distinctions are illustrated with different cost curves for several plants.

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* Decreasing costs can be measured in a third way: as technical innovations or managerial improvements appear. This is a chronological measure of decreasing costs that is universally recognized by economists. Looking backward in any utility industry, we can see abundant evidence that new kinds of machinery and new managerial skills have provided many cost economies. Looking forward in the expanding industries such as the electric and telephone businesses, we can sensibly anticipate further cost reductions. These kinds of decreasing costs are important facts in the economic development of public utility industries; they seem to have a greater historical significance, indeed, than the more conventional measurements of decreasing costs.

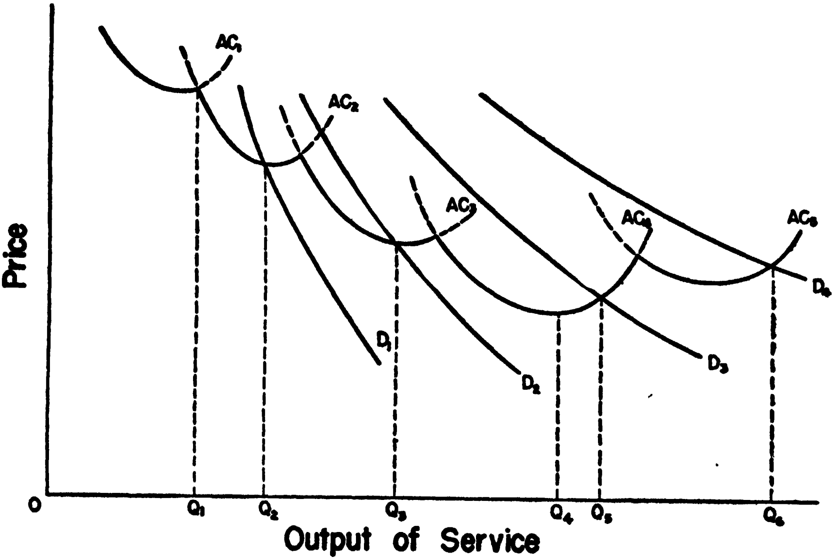

Fig. 3.

Each of the AC curves of Figure 3 represents a different technical condition of operation. And the solid, scalloped line shows the minimum average costs of producing different amounts of service.* If, for instance, a larger output than OQ_1 is planned, the company does not invest in a plant with an AC_1 curve; the second scale of production is used as long as the AC_2 curve is below any other cost curve, the third scale of operations is used when the AC_3 curve is less than any other cost curve, and so on. Given these cost conditions, the average costs of production—the solid line—generally are decreasing through the first four scales of production. When the demand increases from D_1 to D_2, the average cost of service (measured by the intersections of the several D and AC curves) decreases; the average cost of an OQ_2 output is higher than that of an OQ_3 output. But the average costs of production can increase too. When the demand increases to D_3, the D_3 curve intersects the AC_4 curve at a point that is above the optimum output of OQ_4, and a condition of increasing cost is encountered. If output is extended by a D_4 demand to OQ_6, a still greater increase in the average production cost is incurred.

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* Further technical innovations may lower the position of one or more of these AC curves. But a difference in the plant-cost curves is likely to persist.

If the scale of production is extended far enough in any industry, the average costs probably increase. Although they usually overlook the possibility of increasing production costs in the electric or gas industries, writers on public utility subjects often observe an increasing cost condition of telephone service. Since the maximum number of telephone connections increases geometrically as the number of subscribers increases, they say that telephone companies, expanding their scales of production, operate under a condition of increasing costs. This explanation puts emphasis on the increasing costs of switching calls, and does not allow for a decreasing cost condition for small telephone plants.* Other costs of telephone service may increase too. Installing underground conduits instead of overhead lines, paying higher wage rates for maintenance work, and building a wide expanse of lines and plant, a local telephone company incurs increasing unit costs as the output expands. The same is true of other kinds of utility companies. As a metropolis expands, the water company may be compelled to go farther and farther away from the city to get an adequate water supply. The cities in the Los Angeles area, for example, first developed subsurface and near-by surface supplies of water, then the city of Los Angeles built an aqueduct to Owens Valley, and now water is piped almost three hundred miles from the Colorado River. Similarly, when the settled area of a city grows larger, the average costs of urban transportation increase; the transport system must expand to cover more square miles and to haul the average passenger a longer distance.

RIVALRY AND PRICING

A scarcity of plant sites, economies of unification, and the managerial desires for price control are certain to limit the number of utility firms that occupy an unregulated market. The maximum number of rival utility firms is small; it can never be larger, perhaps, than three, four, or five companies. Yet local governments once tried to control the public utility earnings, prices, and service standards with competition. Before 1900 many city governments issued market rights (franchises) freely to all or nearly all applicants.[10] Six electric companies were organized in a single year in New York City; and in 1895 five companies offered service in Duluth, Minnesota. In 1874 Philadelphia had thirty-nine transit companies, and Cincinnati had twelve in 1880.[11] This policy of competition, which led to duplication of plants and did not control prices effectively, was abandoned and was replaced by local or state regulation.

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* Telephone companies may experience both decreasing and increasing costs as they expand from small to large production scales. One study, which was made for Minnesota and Iowa companies, showed decreasing costs per station (subscriber) for small plants.[9] The average total costs decreased up to 1,000 stations, were approximately constant between 1,000 and 4,000 stations, and started to increase after the telephone plants had about 4,000 stations—after the communities had about 15,000 to 20,000 inhabitants.

"Destructive" Competition. The competition of utility companies often was called "destructive" or "cutthroat" competition. During the nineteenth century the competition between railroad systems was considered a good example of destructive competition. A dire result was implied: one company used competition to drive its rivals from the field. The thoroughness of the destruction probably was exaggerated; price wars were occasional rather than regular experiences of utility companies. In many areas the railroads were built ahead of the settlers, ahead of a demand for railroad service that could support all companies. Some companies started rate wars when they reduced prices to get a larger share of the limited business, or when they used price reductions to dissuade other companies from further expansion. Among the local utilities the combative pricing of Bell companies and independent telephone companies also was called destructive competition. When independent firms were established in many cities during the nineties, the Bell companies reduced prices because a lack of customers and inadequate earnings might make the new companies sell out. Local governments could give two or more firms an opportunity to compete; but after they experienced a brief flurry of price reductions, the cities could not prevent either a liquidation of the weak companies or a consolidation of the competing companies. When a new firm promised a rate of 5 cents a kilowatt-hour rather than the 15-cent rate of the established company, the city of Denver gave it a franchise. A rate war followed; the price of electricity declined to 2½ cents a kilowatt-hour; then the new company, lacking financial strength, sold out to its rival.[12]

Several conditions are necessary before a few rival firms engage in retaliatory price cutting. First, at least one of the rival firms has some unused plant capacity;[13] otherwise no firm can see an opportunity to increase its earnings with price reductions. Second, the rivalry is quite ineffective unless the plants are duplicating each other's service, or are capable of the duplication. Destructive rivalry is unlikely as long as each firm develops its own market area, and as long as the buyers cannot readily choose between alternative sellers. If, for example, each of several street railways serves a different area of a city, the companies are not in direct conflict and ruinous competition cannot develop. Third, at least one firm must be willing to challenge the market positions of its rivals. The companies must be fearless of the consequences of a rate war; otherwise they agree on market policies, or they are mutually respectful of each other and avoid a do-or-die struggle for market domination.

A rate war usually broke out between rival utility firms because one company or all companies wanted a larger amount of earnings, or greater security of their present earnings. The companies either wanted larger earnings immediately, or they thought that an elimination of rival firms afforded protection of the future earnings. But the rate war also could start in an inoffensive manner. Intending no calculated harm to its rival, one firm could reduce its prices and try to get a small increase in sales. If the other firms believed that this price reduction was a serious challenge to their existence, they matched or extended further the initial price reduction, intending to prevent the loss of their attached buyers or even to acquire a few customers from the original price cutter. Each seller rationalized his price reductions by reasoning that the plant investment was sunk; he could afford to sell the output of an unused or excessive plant for whatever revenue could be obtained above the increments in current expenditures. Marginal costs instead of average costs controlled the choices of prices.[14] But this reasoning did not replace the lost revenue, or restore the undermaintenance of properties. If the conflict ended in a storybook manner, one badly battered company emerged from a struggle in which the other companies were eliminated one by one.

Milk, a Current Case. Public control of milk prices, which was approved by the Supreme Court in the Nebbia case, was supposed to prevent destructive competition in the milk industry.[15] Milk producer associations, which were organized commonly in the early twenties, dominated the large fluid milk markets;[16] and the distribution of milk was controlled by strong labor unions and a few distributors who had duplicate delivery routes. A milk producer association in an area (the milk shed) was designed (1) to maintain or to raise the fluid milk prices, (2) to keep fluid milk prices above the prices for manufacturing uses of milk, and (3) to restrict the entrance into the field of new producers.[17] In 1932, however, dairy farmers received the lowest prices of a quarter century from manufacturing outlets such as cheese and condensed milk plants. Looking for more income, the independent dairymen were attracted to the markets of the producer associations. Selling milk to new distributors who were not obligated to buy from producer associations, the independent dairymen upset the urban markets of the associations. Price reductions were forced back on the organized dairymen.

To control the competition of dairymen and milk distributors, about twenty-five legislatures created milk control boards. These boards effected increases in milk prices and dairymen's incomes.[18] Later the Secretary of Agriculture supplemented the state milk control with marketing agreements and minimum milk prices. The fluid-milk prices and incomes of dairy farmers increased. But a significant difference was evident between this control and the customary control of public utility earnings and prices: the control of milk prices was set up to serve entrenched interests in the milk industry—to protect the monopolistic positions of producer associations. The principal destruction of the competition was obvious: unorganized dairymen and new distributors were destroying the market control of milk producer associations and established distributors. And the destruction occurred because independent dairymen could afford to sell their milk below the prices fixed by the producer associations. Protagonists of milk price control also spoke of another destructive effect of the competition: the deterioration of the quality of milk and the consequent impairment of the public health. In the Nebbia case the Supreme Court accepted this argument. Yet the sponsors of milk control were not concerned primarily with the contamination of milk, even if they could prove this effect of competition. They were alarmed, instead, about destruction of their pricing authority and monopoly returns. Horace Gray seemed to be right when he said that this "device to protect . . . property" was a "perversion of the public utility concept."[19]

Nondestructive Competition. Destructive or ruinous competition of a few utility firms probably received too much attention. Judged by the available evidence, rate wars were not common pricing experiences of utility companies before the state commissions began to regulate. Even railroad companies, which engaged in price wars more often than local utilities, were not involved in open price competition most of the time. Perhaps the emphasis on this characteristic was a result, in part, of journalistic attention to the spectacular price wars; ordinary and calm pricing conditions were neglected. A public apprehensiveness about price competition was useful to the utility companies. Trying to prevent further grants of franchises, the managers of utility companies liked to publicize the possibilities and consequences of ruinous competition. And the idea of destructive competition also was useful to public authorities, being used to justify public regulation and exclusive markets for new utility firms.

Economists have something to say about price determination under duopoly or oligopoly conditions. But they do not always conclude that rival sellers, even where they sell in the same market and have duplicate plants, inevitably struggle to determine who will dominate the market. Even if an industry has a considerable amount of unused plant capacity, a sharp competitive conflict may not develop between a few rival sellers; for collaboration affords the maximum gain under duopoly or oligopoly conditions.[20] Managerial and ownership interests of utility firms may know the advantages of market cooperation; they may know that everyone loses earnings in a competitive struggle. Nor is each company necessarily seeking maximum profits. Referring to unregulated businesses, Edward Chamberlin says that companies are satisfied to get "ordinary" rather than maximum profits.[21] And a utility company has less interest than a nonutility firm in maximized profits; an enlargement of utility earnings encourages regulatory control. A live-and-let-live spirit, which is common in many American industries, restrains an aggressive company. The aggressor in price competition often is stigmatized by his fellow businessmen; for price cutting is treated as a violation of the rules of the business game.[22] If an operator reduces his prices, he is not called simply a competitor; he is called a price chiseler or some other opprobrious name.

The crux of the pricing problem under oligopoly or duopoly conditions is the anticipated reaction of each seller. Before the management of a firm decides to lower or to raise prices, it wants to know what kinds of reactions can be anticipated from rival firms. These reactions may not be known, of course, until the firms act. Some companies ignore the small price reductions of their rivals. But as long as a firm is not sure that the rival companies are indifferent to price reductions, it may put off the price change and avoid the risk of an earnings reduction. Managerial behavior does not lead straight to a price conflict and ruinous competition. Nor does the notion of destructive competition adequately emphasize how quickly a company can change its mind about an aggressive pricing policy. A brief experience with a price war generally encourages the rivals to reach an agreement. They can reach a verbal or written understanding on their mutual price problems or, as in many instances, they can agree to consolidate their companies and to end their competitive troubles forever.

Another reason for the nonaggressive pricing of utility companies is the limited duplication of utility plants. Even if they have the right to duplicate each other's plants and to take each other's clientele, utility companies often prefer a market-sharing policy. Each firm, giving careful attention to the large fixed investment in its plant, selects a part of a large market within which it tries to operate. Each firm tries to get larger sales and more earnings within its own geographic limits of service. Buyers can choose between companies only where the systems are adjacent, not throughout the territory. As a city grows each company tries to get its share of the new market, but it does not necessarily expand its service area by offering price reductions to new buyers. At least a utility firm does not lower prices in the new territory until it considers the revenue effects of similar price reductions in the old territory. And rivalry in connection with market expansion can be controlled by market-sharing agreements, or by mutual respect for each other. Competitive control of utility prices and service standards is not easily imposed on the companies.

DEMAND CHARACTERISTICS

In legal reasoning the common utility services are necessities. Yet, if the consumption habits of ordinary consumers are studied, there are numerous necessities in American economic life. A certain amount of food, clothing, shelter, and fuel are obvious necessities. And as they adjust to higher standards of living, American consumers add stylish clothing, much meat, automobiles, and a variety of commercial entertainments to the list of necessities. When a common-sense measure of necessary commodities is accepted, utility services are not clearly distinguishable from many nonutility commodities. If the common standard of necessary goods and services had been a bench mark in the Wolff Packing case,* the Supreme Court would have approved the Kansas regulations of food, clothing, and fuel industries.

While utility services cannot be set apart as necessary commodities, they do have some peculiarities that distinguish them from many nonutility services. A special consideration is the time aspect of the demand for utility services. Electricity, gas, telephone, water, and other utility services are not consumed steadily throughout a day, a year, or a business cycle. The storable nature of commodities is an important fact. Most commodities usually are storable for at least a limited time in warehouses or in retail stores. Public utility services, on the contrary, commonly are nonstorable, except for the limited storage of gas and some kinds of water service. And since these services are nonstorable, the companies have much unused plant capacity when buyers do not demand service.

Buyers have what can be called urgent, immediate demands for utility services. Since consumers cannot store up utility service any more than the companies can, they want their services at the time that they need them. Their demands are momentary and fleeting. Electricity, for instance, must be consumed as it comes through the wire or it is never consumed. People demand electricity as they push the light button or the switch on the stove. And if they must pause to bargain about the price, some of their demand for the electricity disappears. Similarly, if a person has a telephone in his home or office, he wants to make most of his calls immediately, not at some indefinite time. Consumption of utility services usually is not deferrable for more than brief periods of time. If it must be deferred for more than a few minutes or a few hours, all or nearly all of the expressed demand for service disappears. Because the demand for the services vanishes quickly when it is not satisfied, buyers attach much importance to the service performance and prices of utility companies, expecting expeditious and efficient service at known and previously determined prices. Looked at in this way, these services seem to be peculiar necessities.

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* This case and other Supreme Court decisions about the nature of public utilities are discussed in Chap. 1.

Elasticity of Demand. Further characteristics of utility services can be described by the demand elasticities of the consumers. Price elasticity of demand, which commonly is called simply elasticity of demand, refers to changes in buyer expenditures as prices are increased or decreased under a given demand condition. It is measured by the slope of a demand curve. Small buyers, particularly domestic buyers, apparently have an inelastic demand for nearly all the utility services that they consume. This means that, if the utility company increases its prices, the buyers are willing to increase their expenditures for utility services; if prices are lowered, the same buyers reduce their total expenditures for service.* On the other hand, if the demand is elastic, buyers increase their total outlay as prices are reduced and decrease it as prices are increased. Seeking additional revenue, a company wants to control price changes according to the price elasticity of demand; price increases are charged to the consumers who have inelastic demands, while reductions go to those having elastic demands.

Income elasticity of demand is another measure of demand behavior. It expresses the relationship between changes in buyer incomes and expenditures on a commodity. It is defined as the rate of change of buyer expenditures on a commodity (at a given price) relative to the rate of change in the buyers' incomes. Buyers have an income elasticity of demand for a commodity when, at a given price, the rate of change in their total expenditures on the commodity is less than that in their incomes. When buyers increase these expenditures at a faster rate than their incomes are increasing, they have an income elasticity of demand for the commodity. On the other hand, they have an income inelasticity of demand when, at a given price, the rate of change in their total expenditures on the commodity is less than the rate of change in their incomes. When buyers, for example, increase their expenditures for a commodity at a slower rate than their incomes are increasing, they have an income inelasticity of demand for the commodity.

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* A more extensive discussion of elasticity of demand for utility services is presented in Chap. 26.

Just as most small buyers seem to have a price inelasticity of demand for utility services, so they seem to have an income inelasticity of demand for the same services. Being unwilling to forego consumption of utility services, these buyers, as their incomes decline, are willing to spend increasing proportions of their incomes for such services. They reduce or eliminate expenditures on household furnishings, clothing, and even some kinds of foods before they pare down their expenditures on water, electric, gas, and possibly telephone services. The small monthly bills of domestic utility consumers, as well as personal dependence upon the services, account for the income inelasticities of demand. A family apparently can forego the purchase of high-price items such as an automobile, a rug, or fine clothing more easily than it can cut down expenditures of $10 to $15 a month on gas, electric, water, and telephone services. Families apparently consider utility services a basic part of their lives—something akin to a subsistence quantity of food. Income inelasticity of demand is an objective measurement of the indispensability of utility services.*

SOME CHARACTERISTICS OF NONUTILITY INDUSTRIES

Again we can observe that some nonutility industries have all or nearly all the economic characteristics of utility industries. A few firms often occupy the markets for many nonutility commodities, and these firms rarely are willing to engage in aggressive price competition with each other. Like the utility firms, the nonutility companies operate under decreasing cost conditions within some output limits. They, too, can show a condition of decreasing average costs when the plant capacity and the plant maintenance costs do not vary with production. Similarly, buyers often have a price inelasticity of demand and an income inelasticity of demand for nonutility services. Even if some differences can be seen, it must be recognized that public utilities cannot be objectively identified as thoroughly distinctive kinds of businesses.

* Because the domestic consumers and other small buyers have an income inelasticity of demand for most utility services, utility firms enjoy a greater stability of revenue and earnings than do nearly all nonutility companies. During the thirties, for instance, the decrease in revenue of electric, gas, telephone, and water companies was not so great as that of the national income. Only the urban transportation industry experienced a great depression decrease in revenue and earnings. Substitution of private automobiles for street railway and bus service was a special reason, however, for the decrease of urban transportation revenue.

Some Similarities. Pure competition is not the common market condition for all nonutility commodities. Many products are priced under market conditions that range from imperfect competition to monopolization. Monopolistic competition, as Edward Chamberlin calls it, is widespread;[23] its chief characteristic, product differentiation, is evident in widespread advertising, many trade-marks, and numerous varieties of salesmanship. Furthermore, many markets are controlled by one, two, or a few firms. One firm controls all or nearly all of the country's output of such products as nickel, molybdenum, magnesium, shoe machinery, glass container machinery, scientific precision glass, and beryllium. The following industries, wherein two firms produce all or nearly all of the output, are examples of duopolies: aluminum (Alcoa and Reynolds), electric accounting machines, plate glass, air brakes, electric lamps, and sulphur. Between 1930 and 1940 the big three—General Motors, Chrysler, and Ford—produced 86 per cent of the automobiles; and they still were overwhelmingly dominant after the Second World War. And the studies of the Temporary National Economic Committee showed that the four largest companies of each industry produced 91.7 per cent of the ammunition, 80.9 per cent of the rubber tires and tubes, 76.1 per cent of the gypsum products, and 72.4 per cent of the agricultural implements. U. S. Steel is the leading firm in the steel industry. It produces about 40 per cent of the steel industry's output—more than 2½ times as much as its nearest competitor.[24] This incomplete record of corporate concentration in nonutility industries illustrates one fact: prices of nonutility services often are fixed under noncompetitive or monopolistic conditions.

Pure monopolies are not common in American industry. But in many industries managerial control of prices is more influential than competition. Pricing practices lean toward monopolization in numerous heavy industries; two, three, a half-dozen or even a dozen rivals do not want to tear each other apart in a competitive struggle. There is a tendency for large, successful corporations to take a live-and-let-live attitude toward each other, to avoid the business disorder and earnings losses of price competition. Each firm wants to get more than "reasonable" earnings; and each firm is content to let its rivals enjoy financial successes. Price leadership is a common condition in the industries where only a few firms operate. Such a leader calculates the price he wants and his followers, who commonly are the lesser producers in the industry, feel compelled to accept his price decision. Furthermore, a few sellers can agree, openly or covertly, on a price policy when they want to "stabilize" competition. A single- or multiple-basing point system is one possibility; a zone-price system, represented by uniform delivered prices throughout each zone, is used in some industries; full or limited freight equalization is practiced in other industries; and full freight allowance to buyers is another way around price competition.[25] The history of nonutility industries is replete with examples of noncompetitive and monopolistic price patterns.

Technical conditions of plant construction do not limit the number of nonutility firms so clearly as that of utility firms. Since automobile, steel, and other plants are not built in the public streets and alleys, the number of plants is not limited in the same way that the number of street railway, bus, gas, water, or electric systems is restricted. Nor do questions of consumer convenience arise to restrict the number of manufacturing firms. Nothing such as the superiority of telephone service from a single company or the integration of urban transportation service under one firm limits the number of nonutility firms. But in some other ways the forces of market domination are alike among the regulated and unregulated industries. Nonutility firms, like utility companies, use consolidations, mergers, and holding companies to reduce the chance of competitive pricing. Similarly, the economies of size, growing with successive technical changes, are reasons for unifications of rival manufacturing firms. And the necessary amount of capital for an efficient scale of operation often is so large, just as it is in utility industries, that only a few persons or corporations can finance the construction of another manufacturing firm.

Several Differences. Even if the ordinary man knows the pricing practices of many nonutility industries, he may not think that he can get large benefits from public price regulation. He does not make frequent purchases of some products that are priced in a noncompetitive or monopolistic manner. Unlike electricity, water, gas, and other utility services that he buys every day, he does not purchase an automobile oftener than once every two, three, or four years. How often does the ordinary American family buy large quantities of cement, plumbing fixtures, and numerous other durable consumers' goods? No intimate, frequently repeated connection exists between the buyers and sellers of many nonutility commodities. A buyer, furthermore, can defer his purchases of many commodities more easily than purchases of utility services. Buyers can and do wait to buy new cars for one or more years, and they can put off purchases of other commodities for even longer periods. If, on the other hand, families must withhold consumption of utility services for as much as a few days or a few weeks, they are very much aware of the loss. And when manufacturers, wholesalers, and retailers do not get utility services immediately, they lose output and trade.

In many instances the ordinary man has no clear, widely recognized relation with many nonutility sellers who practice price administration.

Most buyers, indeed, are unacquainted with many of the pricing practices. Few persons know, for instance, about the monopolistic position and prices of the Climax Molybdenum Company. Most of them do not even know what molybdenum is. Many persons hear about the dominant position of the U. S. Steel Company in our steel industry. But they do not see how the practices of U. S. Steel affect their daily lives. They seldom see the company's buildings and furnaces, never buy directly from it, never feel directly pinched by the pricing practices of the steel industry. They buy many commodities that are made of steel. But they do not think, for example, about the relation of steel prices and automobile prices, even if a moment's reflection reveals a possible relationship. Buyers of electricity are not even disturbed by the dominant position of the General Electric Company as a manufacturer of light bulbs, lamps, and electric generating or transmission equipment. The consumer is directly interested in price regulation at the stage where he makes his purchases, and has only an indirect interest in price control for all production stages.

This brings us to another possible explanation of why public utility controls are not applied to the steel, aluminum, nickel, magnesium, or many other industries. A few firms in a nonutility industry often sell their products to a few firms in other industries. Several companies sell to several other companies. The many buyers of finished products are willing to sit on the sidelines and watch the bargaining struggle of one corporate giant against another. Apparently they think that the automobile manufacturers, driving good bargains with steel companies and other producers, can keep the costs of cars down. At any rate, the regulation of public utilities is designed, except for the Nebbia decision, to protect small buyers who cannot produce their own services. Regulation of electric companies, for example, is directed toward protection of the small residential or commercial buyers, who cannot afford to build their own electric plants, rather than toward protection of the large industrial buyers who can easily finance their own generating plants. As public utility regulation stands now, it does not protect one large corporation against the monopolistic prices of another.

One difference between utility and nonutility industries is more important than all others: legislatures and the courts impose a public utility status on some industries and not on others. Being the final legal authority of the country, the Supreme Court alone has power to give meaning to the public utility concept. Even if economic reasoning and economic facts show an inconsistent or only a vague distinction between utility and nonutility industries, the Supreme Court still determines whether an industry does or does not have public-interest status. The Court is not guided primarily, of course, by economic thinking, and it is free to consider or to ignore economic facts. Nor does it use objective tests, such as the economist likes to use, in determining what companies are public utilities.

Just as liberty cannot be described in a mathematical manner, so a formula cannot be constructed that measures the public utility status. The limits of public utility regulation are not measured in a mechanical fashion. Working in a broad social environment and choosing general rules of social behavior, the Supreme Court is not confronted with a simple problem like the separation of sheep from wolves. Yet, even if it is vague, the public utility concept is not inscrutable. The Court does not put all noncompetitive or monopolistic business under a public regulator; an industry's business conduct is not bad and intolerable merely because pure or nearly pure competition does not prevail. Trying to preserve much of the traditional individualism of society, legislators and judges do not extend public regulation to all noncompetitive sellers. The Supreme Court gives the public utility concept a narrow scope; public utility regulation is used only where the private company managers, exhibiting intolerable conduct, cannot be trusted with the distribution and pricing of commodities. And the Supreme Court relies on its judgment, rather than factual investigations and technical reasoning, when the tolerable limits of acquisitive business are determined, when the basic individualism of our national life is modified by public regulation.

Chapter 3

Local Regulation and Franchises

AT ONE time municipal authorities controlled utility companies; later the state commission became the common regulatory body; and after 1930 federal regulation, which supplemented (but did not supplant) state-commission control, became powerful. The last half of the nineteenth century, particularly the years after the Civil War, was the time of municipal dominance in public utility regulation. This was a period of rapidly growing industries and cities, a time when cities demanded and received home-rule rights from the state legislatures.[1] At this time new utility industries, the electric and telephone industries, began to develop; and other utility services, such as street railway and gas service, expanded rapidly under the impetus of population growth and technical changes.

Before 1900 most utility companies, exclusive of steam railroads, were local enterprises. Taking account of the local scope of public utility operations, the municipal authorities, who did not trust the state legislatures and their large complements of rural members, demanded and were given authority to regulate the local utility enterprises. But local regulation was rarely well done. It often became entangled in the confusion of local politics; the regulatory machinery was poorly adapted to the rapidly changing technical conditions of nearly all utility services; such matters as accounting and financial regulation commonly were neglected; and, worst of all, untrained men struggled to fix rates and service standards—or were bribed. When the shortcomings of local regulation were evident and when the electric and telephone companies ceased to be local enterprises, state commissions began to take the place of local authorities in utility regulation.

THE NATURE OF A FRANCHISE

In this discussion of local regulation we need to understand the nature of a franchise, the common instrument of municipal control of utility companies. Before a company can perform utility services, it must obtain the right to occupy a market. A franchise gives a person or company the right to sell a service in a defined market area for a specified length of time. It also grants the use of public property to its holder—certain highways, streets, and alleys without which the holder cannot sell his service. When a company receives the right to use public property, it usually is compelled to accept some obligations about the performance of service. These obligations, which are the regulatory provisions of the franchise, concern such matters as the quality of service, future extensions of service, selling prices (even specific maximum prices), the price at which the local government can buy the private plant, and compensation for the use of public property.

For a time the state legislatures issued franchises directly to utility companies. Later the legislatures, yielding to the home-rule protagonists, delegated the control of franchises to local governments. Issuing franchises to gas, street railway, and other local utility enterprises, the municipalities acted as agents of the state legislatures. When the first general franchise laws were passed, the legislatures often gave the cities unlimited authority to issue franchises. This authority was restricted in the latter part of the nineteenth century. After many local governments carelessly or dishonestly distributed franchise privileges, legislatures limited the duration and other conditions of franchises.

Franchises are issued exclusively to businesses that have a public-interest status. Wherever local regulation still is dominant, the possession of a franchise, in fact, identifies a public utility company. The franchise—the privilege of using public property and occupying a market on the one hand, and the specified obligations of the company on the other—sets its holder apart from businesses in general. It is a special rather than a general right of a person or company. Speaking of these characteristics of the franchise, Justice Brandeis says,

> . . . that a franchise to operate a public utility is not like the general right to engage in a lawful business, part of the liberty of the citizen; that it is a special privilege which does not belong to citizens generally; that the State may, in the exercise of its police power, make that a franchise or special privilege which at common law was a business open to all; . . . that it is of the essence of a special privilege that the franchise may be granted or withheld at the pleasure of the State; that it may be granted to corporations only, thus excluding all individuals; and that the Federal Constitution imposes no limits upon the State's discretion in this respect.[2]

DEVELOPMENT OF LOCAL CONTROL

As a utility industry began its development, the cities often made generous grants of franchise privileges. The immediate municipal purpose was possession of the new utility service. A utility company was considered a benefactor of the public rather than a public servant. It was a firm that could provide transportation service, replace kerosene and gas lamps with safer and more convenient electric lights, or give the city a new communication service. In these services the local government saw more health and comfort for the whole populace. And the municipal authorities and civic organizations saw the services as means to greater commercial and population growth. If a city government and the people had real civic pride, street railway service, gas heating, electric lighting, and telephone communication were treated as indispensable improvements. When one city obtained these services, its rivals wanted them too; no city wanted to be known as a backward, unpromising city.

Desiring utility services above all else, the cities made the franchises attractive to private companies. Some granted exclusive franchises, protecting the utility companies against competition for the term of the franchise. Long-term franchises were common; some cities even granted perpetual franchises.[3] At this time the cities usually did not exact any compensation, either in special taxes or in street-paving and street-maintenance obligations, for the privileges that they gave to utility companies. And sometimes, in fact, the cities were willing to give tax-exemption privileges to the new utility companies. Since the public attention was directed toward getting services, the price of service, too, was a secondary consideration of franchise negotiations. The companies often could choose their own prices. Just as the railroads were given land, tax exemptions, and generous charters to facilitate construction of lines and settlement of the West, so the cities did whatever was necessary to get street railway, gas, electric, and telephone services. Some cities were less generous with electric and telephone companies after they had time to reflect on their franchise experiences with street railway companies. Yet each new utility service commonly was considered valuable enough to justify a generous grant of privileges and the imposition of only a few obligations.

Assertion of Authority. Local governments soon discovered that they were giving valuable privileges to the utility companies. When a private firm was granted a large service area and had either complete authority or substantial freedom to fix prices, the profits and dividends of the company revealed the value of the franchise. Having the utility services, the cities ceased to be generous with franchise privileges. After 1875 the street railway industry, prospering as a consequence of an expanding urban population, was singled out for political and regulatory attention. When a city decided to do somthing about the earnings of street railways or other kinds of utility companies, there were several general courses of action open to it. To eliminate excessive earnings, it could reduce the consumer prices and require better grades of service; franchises could be issued to additional companies so that competition might force down the prices and improve the service; they could be sold to the highest bidders; or taxes and street-maintenance obligations could be assessed against the franchise holders.

A policy of regulation and taxation began to replace the policy of inducing investments in new utility industries. In large cities the municipal authorities began to prosecute utility companies; they began to impose controls and obligations that were expected to compensate for the companies' privileges. Prices and service conditions became paramount considerations of franchise negotiations. If maximum prices and minimum service requirements were fixed for the duration of the franchises, the municipal authorities tried to drive hard bargains. To provide more frequent opportunities for revisions, local governments commonly shortened the terms of franchises. A term of twenty to thirty years became common; before 1900 some state legislatures fixed a maximum term, which commonly was twenty-five years. Nonexclusive franchises were widely used because legislative amendments to general franchise laws required them, or because the local governments had an interest in competitive control or the threat of competitive control of prices and service. A nonexclusive franchise also allowed the city to operate a municipal plant before the franchise of the private company expired. Some cities also wanted immediate cash payments for the privileges. Forsaking direct regulation of companies and showing no particular interest in price reductions for consumers, these cities fixed prices for franchises or required open bidding for them, assessed taxes against utility companies, and affixed paving and street-maintenance obligations on the franchise holders.

Franchise Politics. Utility companies did not submit benignly to price regulation, competitive bidding and shorter terms for franchises, more taxes, and special obligations of street maintenance. Trying to get or to keep the valuable franchise privileges and wanting at least liberal returns, the companies built up political influence, offered bribes, and even controlled municipal elections in some cities. The competence of a utility-company official was measured by his political contacts and his ability to hold franchises. A good social standing with political bosses and officeholders, an ability to create and to sustain a favorable position with local newspapers, perception of political developments, and a talent for parrying customer movements and reformers—these were the traits of an able executive. Guided by men of this type, utility firms did anything that preserved their franchises and their investment values. To obtain political support, company managers often gave free services to politically influential customers. Free streetcar rides, for instance, were given to policemen and firemen. But political discrimination between customers was mild in comparison with the utility-company corruption of local government—with their election funds, their bribes, and their direct participation in government.

In New York City the Board of Aldermen was called the "Boodle Board" as a result of its corrupt transactions in utility-company franchises.[4] During the latter part of the nineteenth century Mark Hanna was not only the "money" man behind street railways, banks, and the press in Cleveland, but also the political boss of the city.[5] At the turn of the century, when the street railway franchise in Cleveland was reputed to have a value of $20,000,000, the public petitioners on franchise matters sat in the gallery during Cleveland Council meetings and dangled nooses over the heads of councilmen who were suspected of graft.[6] Charles Yerkes, owner of the street railways in the northern and western parts of Chicago during the eighties and nineties, was dominant in the political affairs of Chicago, was hostile to regulatory proposals, and did not make street railway improvements until his franchises were granted.[7] The Illinois legislators felt Yerkes's political pressures, and saw his men spend money to get favorable franchise laws.[8] A few men in San Francisco, who obtained their franchises by bribery, resorted to arson, murder, and dynamiting to retain their privileges. During graft prosecutions in San Francisco a house was blown up to destroy evidence, and a prosecutor was shot in open court.[9] Throughout the country the holders of valuable utility franchises manipulated and fought to keep their privileges. And they showed a hard indifference to the despoiling effects that they had on local government.

After the utility companies, particularly the traction interests, had outwitted the municipal authorities or manipulated franchise politics in many cities, the reformers came. Treating the utility "barons" and the political bosses as common evils, the reform administrations and "strong" mayors often tried to compensate for the earlier laxities of government officials and the political deviations of utility companies. Trying to be vigorous regulators, they pressed down prices, assessed new and higher taxes, and increased the special obligations of utility companies. Full of the spirit of good government, they were determined to make the utility interests pay for many years of exploitation. But ruthless impositions of tax and street-maintenance obligations and uncompromising reductions of prices did not retrieve the past excesses of earnings; a utility company could not currently pay more than it earned. When local controls were tightened, the street railways were burdened with obligations and taxes that became particularly onerous after the demand for urban transportation service decreased in the twentieth century. Many street railway and bus companies can trace some of their current financial troubles to regulatory "improvements" that were effected before 1910.

The Decline of Local Regulation. Despite the reform efforts and sober studies of local regulation, state commissions took the place of local aldermen or councilmen in most states. That change began before the First World War; about half of the state legislatures created commissions before 1920. In a few states, however, the local governments did not lose their authority to regulate utility companies. No commission of any sort was established in Delaware; in Iowa and Florida the commission regulation was confined to rail and motor transportation; and other commissions controlled only one or two utility industries other than intercity transportation—telephone firms in Minnesota and South Dakota, telephone and urban transportation companies in Nebraska and Mississippi, and gas service in Texas. The state of Ohio made a peculiar division of regulatory authority between the cities and the state commission.* The Ohio Commission has complete control of railroads, telephone, and telegraph companies. Control of street railway and local bus companies, on the other hand, is completely under the jurisdiction of the municipalities. In the case of electric, gas, water, and heating companies the cities can fix prices and other service conditions with ordinances that have a maximum term of ten years. When one of these companies does not like a new ordinance, it can appeal to the Public Utilities Commission and the commission has authority either to confirm the ordinance or to fix reasonable requirements for the company. And if, perchance, the city does not renew an ordinance, the commission can regulate as though it has complete control of the company.[10]

FRANCHISE PROVISIONS

The reader should be aware of several general characteristics of franchises. First, franchise regulation is largely a past experience; as state commissions were established, the franchise ceased to be a common instrument of public control. A discussion of franchise provisions, consequently, has current significance in only a few states. Second, where local regulation still is exercised, the provisions of franchises are dissimilar, of course, for different kinds of utility companies. A bus company may be required to provide a certain minimum frequency of service along various routes, while the service provisions of an electric franchise are related principally to the voltage and continuity of service. Nor are franchises alike in all sizes of towns. The village councils know little of regulatory matters, and frequently accept the provisions that the companies ask for; in a large city the franchise often is a long and detailed document, the result of extensive negotiations between the municipal and company authorities. But the general provisions of franchises are similar: they always specify the duration of the agreements, commonly contain provisions about prices, service standards and the prices at which the cities can purchase the private properties, and sometimes prescribe some special obligations or the compensation for franchise privileges.[11]

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* The Ohio legislature created a "strong" commission in 1911. But a year later the legislature, acceding to the demands of local government interests, returned a large measure of regulatory authority to the municipal governments.

Nonexclusiveness. Cities usually do not give utility companies exclusive rights to sell service and to use public property in a defined market area. Years ago, when some persons still believed in competition as a means of utility price and service control, state legislatures frequently forbade the issuance of exclusive franchises. Even though the public policy of competing firms was discarded a long time ago, the practice of issuing nonexclusive franchises persisted. These franchises are issued now, because they do not stand in the way of municipal construction and operation of utility plants. When a franchise agreement simply gives a private company a right to use the public property, it does not delay the construction of a municipal plant that can perform the same service. If a city, on the contrary, grants exclusive market privileges and later wants to perform the utility service, it either must condemn and purchase the private plant under the city's right of eminent domain, or must set aside the municipal ownership plans until the company's franchise expires.

Price and Service Provisions. When specific prices are fixed in the franchise, they frequently are higgled prices. Forsaking objective methods of price determination, each side of the transaction, the city officials or the representatives of the company, tries to drive a good bargain. If, for instance, the price of bus service is being fixed, the municipal authorities try to keep the price at or near the traditional fare, while the company wants consideration of real or imaginary increases in the service costs. Since the price is fixed for a 10-, 15-, or 25-year period, each side of the franchise negotiations tries to anticipate the average cost and the average demand conditions. Looking ahead to future economic conditions, the city and company have the proper time perspective of franchise price determinations. But who knows what the future costs and demand conditions will be? Faced with unknown future behavior of costs and revenue, the bargainers probably do not try to exercise their long views of price fixing. Instead, they are likely to consider the present and past behavior of revenue and cost, and endeavor to make the most of their persuasion or bargaining force in the transaction. Current forces and conditions are translated, therefore, into static prices that may not bear any relation at all to either the probable conditions or the yet unknown conditions of future operations.

A few years after a franchise bargain is concluded, the fixed price can be meaningless. That price is simply a maximum price. Although for the duration of the franchise the company cannot charge a higher price, it can voluntarily reduce the price. In some utility industries, particularly the electric industry, the companies experienced economies of production over the years that justified many voluntary price reductions. Technical innovations were common reasons for these price changes. Or population changes and the development of new uses for electricity, both of which allowed larger and more economical scales of plant operations, led to price reductions below the franchise maximums. In these cases the franchises did not control the prices. These were regulated instead by the companies' own judgments of demand and cost behavior, and by their own profit objectives.*

A utility company can be adversely affected, too, by the maximum price provisions of a franchise. If the general price level increases after the franchise is negotiated, the company can incur a deficit. During the First World War, for instance, many utility firms were pinched between maximum prices on the one hand and rising production costs on the other. Some cities gave the companies emergency increases in the maximum prices; even so, a number of street railway companies went into receivership between 1915 and 1920.† Similarly, an increase in union-wage rates can seriously affect the earnings of a firm as long as it cannot break through the price ceiling that is fixed by the franchise.

Like the maximum price provisions, the service standards that are specified in franchises may be obsolete long before the franchise expires. Technological changes often outmode the prescribed service standards as well as the old equipment. Although a certain heat content (usually expressed in British thermal units) is specified for the manufactured gas that is sold under a franchise, the desirability of natural gas service, which contains about twice as many B.t.u. per cubic foot as manufactured gas does, may become apparent before the franchise expires. An amendment to the franchise must be agreed on before natural gas service is substituted for manufactured gas service. Changes in demand, too, can upset the service provisions of a franchise. Specifications on the routes, frequency of service, or kinds of equipment for urban transportation can soon be at odds with population changes, riding habits of the populace, or new techniques of service production. Shortly after a franchise is negotiated, the company may see a profitable opportunity to substitute busses for streetcars; as the population shifts within the city, an abandonment of some old routes and establishment of new service lines may be desirable; and changes in the working hours of the populace may necessitate revisions of service schedules. Nor can rules be easily fixed in franchises for extensions and abandonments. Most franchises do not contain provisions, indeed, that control the new extensions of service. Except for such general rules as serving all who come, the companies use their own discretion as they fix the new limits of service.

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* Under certain conditions, however, the city can alter the maximum prices and other provisions before a franchise expires. These changes depend on whether the franchise is a contract. If it is not, the city is not bound to its terms. When the general franchise law of the state forbids a city to negotiate contracts with utility companies, a franchise clearly cannot be a contract and the city can undertake a revision of franchise provisions. But, in the absence of a statutory ban, the contractual nature of a franchise is not perfectly clear in judicial opinions.[12]

† During this period the service-at-cost franchise was introduced to control street railway fares under changing cost conditions. It provided for increases and decreases in streetcar fares as the earnings of the companies decreased or increased. This somewhat automatic form of earnings and price control is described in Chap. 18.

Taking account of these limitations of franchise negotiations, a city can leave specific prices and service standards out of franchises. As long as future changes in demand, costs, and technology cannot be predicted reasonably well, the city can make a general specification of reasonable prices and adequate service. The general standards of these specifications give flexibility to local regulation. Exact prices and definite service standards, which are not specified in the franchise, can be fixed as frequently as the city and company agree on revisions. The municipal authorities undertake investigations whenever they believe that cost and revenue changes provide bases for rate revisions, or whenever technical and demand conditions seem to justify a correction of service standards. These discretionary investigations obviously may not give the buyers frequent revisions of price and service policies. And the buyers cannot be sure that city officials can effectively control the price and service matters. The general provisions for reasonable prices and adequate service simply give the city officials more opportunities to investigate and to bargain than if specific prices and service conditions are parts of the franchise transactions.

Term of the Franchise. In the days when local governments were prominent in utility regulation and the franchise was the common instrument of control, opinion was divided on what was the best term of duration for a well-drawn franchise. Utility-company investors and managers wanted long-term franchises. Apparently a forty-year or fifty-year franchise was a long-term franchise by their standard of measurement. Any limited term, indeed, was too short, because they wanted to occupy a market forever. On the other hand, the consumers wanted short-term franchises. By their standard a 5-year or 10-year franchise was a short-term franchise, and a 25-year franchise was a long-term grant. Since the consumers sought lower prices and service improvements, they did not want to wait for better price or service bargains. A 1-year franchise probably was the ideal for the consumers who wanted continuous price reductions and unending improvements of service.

The low cost of investable funds is supposed to be the principal advantage of long-term franchises. Since utility companies invest heavily in equipment that has a long service life, they commonly do a large amount of long-term borrowing. A new or refunding issue of bonds may have a due date that is beyond the expiration date of the franchise. The franchise may expire in 15 years, while the company wants to sell 25-year bonds. As long as a renewal of the franchise is not a certainty, the buyers of the 25-year bonds may believe that they are taking a greater chance of default than if the franchise has another 25 or more years to run. Seeing a greater risk or default, the lenders want a higher rate of interest on their funds. At the same time the company withholds some decisions to borrow and to invest, because it does not know what prices can be charged in future years and what obligations may be imposed on it after the present franchise expires. If the uncertainty of a franchise renewal, future prices, and special obligations are great, the company may curtail the plant-maintenance expenditures. Under these conditions a long-term franchise reduces the cost of capital, facilitates service expansion, and prevents undermaintenance of equipment.

The reasoning about the effect of a short-term franchise on interest rates and investment decisions frequently is overdrawn. If the franchise of an established company expires and is not renewed, the firm is likely to continue the production of utility service.* In many cities the expiration of franchises does not seem to alter the market positions of utility firms. Rival companies are not waiting for opportunities to enter the markets. One company's plant saturates each market, and other investors do not have an interest in a duplicate system. Some systems operate for years without renewals of their franchises; and their financial condition and the quality of their services never seem to deteriorate as a result of the experiences. Little evidence is available nowadays to confirm the claim that economical financing cannot be effected unless long-term franchises are issued.

When the franchise contains specific prices and service requirements, the public interest calls for a short-term franchise. A short-term franchise assures new price and service provisions before the old provisions are too far out of line with technical, cost, and demand conditions. Contrasted with a long-term grant, the short-term franchise improves the continuity of local regulation of utility companies. A 10-year term seems to be the maximum sensible interval between price and service bargains. During a longer period of time, say a 25-year period, numerous and important technical innovations, demand changes, and changes in cost behavior can occur; changes can occur that make the franchise provisions meaningless and increase (or decrease) the earnings of utility companies that operate in expanding markets or in technically immature industries.

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*When the regular franchise expires, the company operates under an implied day-to-day franchise. It has a temporary right to use public property, a right which it loses only when the public authority takes up the use of the property itself or grants the right to another company.

When the general standards of reasonable prices and adequate service are specified in franchises and when the actual prices and service choices are left to the subsequent bargaining of municipal and company representatives, long-term franchises are not contrary to the public interest. Since the obligations, especially those of price and service, are stated in a general manner, they are never out of date. But the municipality may not want to grant a long-term franchise to a company. Such a privilege affects the city's own opportunity to construct and to operate a utility plant. As long as a company has a right to occupy a market area, a municipality has a choice between competition with the established company, purchase of the private plant under eminent domain proceedings, or deferment of municipal utility operations until the franchise expires and the private firm can be told to vacate public property. If attention is given to their freedom to use the public property, municipal authorities believe that a franchise with a longer term than, say, fifteen or twenty years is not in the public interest.

Indeterminate Permits. A special kind of franchise is the terminable franchise or indeterminate permit, a grant that fixes no specific time period for the use of public property. General laws for indeterminate permits are in force in Oklahoma, Indiana, and Wisconsin; modified laws have been passed in several other states. The Wisconsin use of these permits, which was authorized in 1907, is well known in public utility regulation. In Wisconsin, where effective regulation by the state commission nullified the need for even a small amount of local regulation, the cities are required to issue indeterminate permits. This kind of franchise shifts regulatory control from the cities to the state commission. The commission takes over the control of prices, service, finances, accounts, and other matters, while the cities retain the right to choose the companies that can use public property. The right of a company to occupy a local market can be terminated in two ways. It ends when the firm does not perform satisfactory service.[13] And it ceases when the municipality buys the private plant at a price that is agreed upon by the company and city or, as in Wisconsin, at a price that is fixed by the state commission.

The indeterminate permit is superior in some ways to the ordinary, fixed-term franchise. Insofar as higher capital costs, slow installation of improvements, and cautious plant expansions are consequences of limited-term franchises, a public benefit is realized from the use of indeterminate permits. These permits reduce one possible uncertainty of utility-company operations: continuance of the right to use public property. Moreover, they can be used to get around some political problems that are associated frequently with the limited-term franchises. In particular the rights of the companies to use public property are not determined periodically by voters, who never really know how good or how bad the conduct of the companies is. And when the indeterminate permit is used in the Wisconsin manner, it gives assurance of better price and service bargains than a limited-term franchise. Price and service control usually is improved after regulatory authority is transferred from municipal governments to state commissions.

Local interests often are strongly opposed to the use of indeterminate permits. Standing by the home-rule tradition, they object to the loss of local control of utility companies. The indeterminate permit law in Wisconsin, for instance, unquestionably takes regulatory authority away from local governments. Yet the substitution of state regulation for local regulations seems to be the most beneficial public effect of the indeterminate permit. Expert state regulation is applied to utility companies; at least a clumsy local regulation is replaced by a less clumsy state regulation. If regulatory effectiveness rather than the location of regulatory authority is the test of an indeterminate permit law, public utility consumers in Wisconsin, for example, certainly benefit from the transfer of regulatory authority. Second, the local authorities and consumer interests usually do not like the fact that, if municipal operation of utility plants is to be undertaken, the city is compelled to buy the property of the private company at a specified price. They want to retain an alternative choice: they want to retain the right to build a municipal plant, and to oust the private company from public property. Given the alternative of municipal plant construction, the city authorities can use the threat of plant duplication and competition to press down the price of the private plant. Third, the opposition asserts that, except for the possible municipal purchase of the private plant, the indeterminate permit is actually a permanent permit. Even though the city believes, rightly or wrongly, that the service of the company is unsatisfactory, it still must prove the inefficiency of the company. As one writer observes, the indeterminate permit can ". . . be characterized as tenure except during outrageous behavior."[14] The principal question, however, is not really one of tenure; it is a choice of the best regulation of utility companies.

Municipal Purchase. A limited-term franchise should contain provisions for the municipal purchase of the plant of the private company. A specific price can be written into the franchise; this is the price that the city pays to acquire the private property any time before the franchise expires. Or a method of price determination can be specified. With one kind of provision the city is required to buy the private plant if it wants to produce utility service; with another provision it has a right to buy the plant, but is not compelled to do so. Even when the city can choose between the purchase of a private plant and construction of its own system, it often prefers to buy the private system. If a private electric, gas, or water system is purchased, the city has an immediate market for service. It escapes a competitive and financial struggle when a municipal plant is not operated alongside a private plant, and useless duplication of plants and bitter political friction are avoided. For street railway and bus operations a municipal purchase of the private plant reduces congestion of the streets, and prevents confusion and disintegration of transportation schedules. But the purchase provisions of franchises are not easily drawn up so that they cannot be misinterpreted. Given specific property values at the time of franchise negotiations, the city and company can avoid some future conflicts if they figure subsequent property additions at their original costs. Measurement of depreciation, however, is likely to be a troublesome part of the purchase-price problem. Even if a method of depreciation measurement is a part of the franchise bargain, a conflict still can arise about the exact amount of the property-value depreciation. That is true because the franchise cannot possibly control the property maintenance or predict the future obsolescence of property.

Special Obligations and Taxes. Even though municipal regulation of utility companies was tightened during the last half of the nineteenth century, cities expected compensation for the use of public property. If monopoly returns could be obtained with a franchise, the city wanted part or all of them. Consequently the street railway companies ordinarily were required to pave, maintain, and clean snow from the area between and adjacent to their tracks. Some franchises required street railways to do more—to pave whole streets, to build and maintain sidewalks along the streets where they operated, to remove snow from whole streets, and to sprinkle the streets in the summer time.[15] These special obligations still burden some street railway companies. And private water companies often are required to furnish free water service for fire protection and other municipal uses. Electric companies frequently contribute electricity for street lighting and city buildings; and a lesser amount of free service is taken sometimes from gas and telephone companies.*

Taxes also were used to recapture the values of franchise rights. When the street railway industry still was new and prosperous, the franchises or city ordinances assessed annual license fees of $20 to $50 for each car; these taxes restricted the number of cars in service and caused a crowding of the cars.[17] License fees for other kinds of utility companies were based on the number of electric poles, or the feet of water and gas mains. After 1875 many cities changed to a gross-revenue or a net-revenue basis of franchise taxation. Five per cent of gross revenue was a common annual tax. A few cities, such as Chicago, used a net revenue basis of taxation for street railways and other utility companies.

Municipal authorities could reduce the prices of utility service rather than levy special obligations and taxes. When the earnings of traction companies, for instance, were high, the public interest was served by taking excessive earnings away from the companies. Public utility companies were not entitled to more than reasonable amounts of earnings; the standard of reasonable earnings and prices was a settled fact. But disposition of the excess, either to buyers in the form of lower prices or to the local government, never became an important problem of local regulation. Apparently the choice between taxation or special obligations and rate reductions was a matter of political opportunism: pressed hard by taxpayer complaints, the local officials found utility companies easy sources of tax returns; harried by utility consumers, they also tried to make some price reductions. No reasoned relationship was established between taxes or special obligations and rate regulation. Consequently under local regulation the utility companies usually paid higher local taxes than the nonutility companies; they collected revenue for the cities and performed other municipal functions such as street maintenance. And the consumers unquestionably lost possible price reductions or service improvements when special taxes, large amounts of street paving, and free services were charged against the companies.

Historical explanations can be given for the special obligations and taxes, but cities do not have good current explanations for them. Yet some cities still assess the special obligations and taxes. The special obligations and taxes persist despite the fact that the earnings of the street railway industry, for instance, are low and receiverships are common. In some places these obligations and taxes hasten service deterioration and even service abandonments. They persist, even though state commissions provide a more effective means of price-service control than the cities could enforce at the time when the obligations and taxes were first assessed. Lacking ability to regulate effectively, the local governments once had an excuse for the assessments. But nowadays, in an environment where the regulation is improving and sometimes is excellent, payments for the use of public property are limitations of price reductions or service improvements.*

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* Some state commissions forbid cities, however, to attach free-service obligations to franchises.[16]

DEFECTS OF LOCAL REGULATION

As one looks backward over local control of utility companies, the franchise seemed to contain the most important defects of local regulation. Control of security issues, dividends, property or security acquisitions, and consolidations of companies usually were not parts of the franchise regulation. Nor did the franchises control the accounting systems and expenditures. Lacking supervision of financial and accounting matters, municipal authorities never really knew, except in the uncommon instances of detailed audits, whether the costs of service justified the price demands of the companies. The cities rarely had reliable factual information for earnings and price regulation. If specific prices and service conditions were included in a franchise bargain, then the city and company took the chance that demand and cost behavior might change before the franchise expired. If only the general requirements of reasonable prices and adequate service were specified in the franchise, then the city officials were hard pressed to negotiate price and service bargains at later times.

When they were regulated commonly by local governments, the utility companies often were the "whipping boys" of political campaigns. Candidates for local offices singled out the prospering utility firms for attacks. (Even when regulatory authority was transferred to state commissions, the local politicians still continued the attacks on these companies.) When a person was elected to an important local office during the dominant period of municipal utility control, he believed that he had "to do something" to confirm his campaign promises about lower electric, gas, street railway, and water rates. His view was shortsighted: he desired rate reductions, without considering their effect on private investments. He used any possible political power to bludgeon rate reductions out of the companies. In this environment a company had a precarious financial existence. Since the participation of the officers of a company in city politics was more important than anything else in the life of a firm, the utility managers provided election funds, bought influence with the press, and even bribed city officials.

City officials always seem more inclined to prosecute than to regulate the utility companies. They commence a controversy, not an inquiry. As politicians they cannot admit that the practices of the companies are right. A firm is treated as an organization from which some public benefaction is expected; this is true, even if the firm cannot afford the benefits. Politics calls for substantial rate reductions. And political interests must have compensation, too, for the use of public property; the company must be exploited even more completely, perhaps, than it exploits its customers. When the regulatory attitudes of local governments are considered, state commission control is preferable to local regulation. This choice does not imply that state commissions are thoroughly unbiased, that they look for objective facts alone and never practice vindictive regulation. State control of utility companies is not all expertness and dispassion; political views have a bearing, too, on the commissioners' regulation. Yet, even if it generally is acting in the interest of buyers, the state commission is an independent and permanent political organization that is somewhat more removed than a mayor or city council from dynamic politics.

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* For a further discussion of the relation of tax and regulatory policies see Chap. 11.

Local authorities often lack the funds and the talent for excellent regulation. Even in the largest cities the utility regulation usually is an incidental part of government activities. When a regulatory problem arises, the city officials are not well equipped to face the array of engineers, lawyers, and other specialists that the company puts on the case. Municipal officials, who frequently hold office for brief periods of time, do not have time to acquire regulatory ability before some other persons replace them. And the city usually does not hire the kind of advisers who are needed to counterbalance the ability of utility company representatives. In the end the larger part of the bargaining force, except for the belligerency and political sagacity of the local officials, is on the side of the company.[18]

Regulatory proficiency is missing particularly in the small cities and villages. A metropolis has sufficient funds to hire investigators and advisers. But the village or small city does not have the financial means of regulation. Many village councils, lacking even rudimentary knowledge of the ways and purposes of regulation, are likely to grant the franchise provisions that the company requests. They grant the wishes of the company because they know nothing else to do. Thus the quality of local control of utility firms varies from the not quite effective regulation in larger cities, to the regulatory void in country towns and county seats.

The service limits of some utility companies have gradually moved beyond municipal boundaries. In the early days of municipal regulation the electric, telephone, manufactured gas, water, and street railway systems were "local" enterprises. The optimum plant usually was one that was large enough to serve one town or city. Many manufactured gas, water, and street railway companies still are predominately local enterprises. But, since technical innovations now provide significant economies of large-scale production, the electric, telephone, and natural gas firms commonly operate far beyond the jurisdictional limits of single cities. If a local government is negotiating an electric company franchise, it must examine operating costs of generating, transmission, and distribution equipment that is spread over several counties and that is used to serve many towns. A condition of joint regulation exists between numerous cities; all the cities must examine the same costs of company operations, the same joint costs of producing and transmitting electricity for the several cities. The scope of state commission authority, consequently, is more nearly consistent than local regulation with the technical scope of electric, telephone, and natural gas service.

A DIVISION OF AUTHORITY

When state commissions begin to regulate utility companies, they take over some powers that are exercised by local governments. State legislatures determine the location of regulatory authority. Just as the legislatures can delegate regulatory powers to local governments, so the same legislatures can limit or even withdraw the powers. Acting in a typical manner, a legislature can delegate price, service, finance and accounting controls to the commission, although exceptions can be made for the "home-rule" cities. The local authorities still can choose the holders of franchises. But there is another question about the division of authority: what is the status of existing franchises? Is the franchise a contract between the city (or consumers) and the company that the commission must respect? The state legislature can settle the matter, specifically stating that the state commission can or cannot alter the price and service conditions before the franchise expires. Although the legal reasoning is not altogether clear, the Supreme Court does say in several cases that a legislature can authorize such a contract as long as the franchise does not suspend regulation for an excessively long time.[19] On the contrary, if the state legislature says nothing about the validity of unexpired franchises, the commission need not respect them. Following an old legal principle, the Supreme Court resolves ambiguities and omissions in favor of the commissions and the public interests.[20] According to the Court, the franchises can be ignored by state commissions when the legislatures do not clearly delegate contractual authority to the cities, or do not specifically require consideration for the agreements.[21] In any case, the state regulation is only a question of time after the commission is created; it begins immediately in the absence of valid franchises, or it begins after the franchises expire.[22]

Issuing franchises for the use of their streets and alleys, cities have only a vestige of their former regulatory powers. Even the municipal choices of utility companies and local control of public property uses are no longer important, because the state commissions exercise a similar power over the companies. The commissions issue certificates of convenience and necessity, giving rights to occupy designated markets for indefinite periods of time. Because both of them grant rights to perform certain public utility services, franchises and certificates of convenience and necessity are essentially the same things. And since the commission is the superior authority in regulation, the certificate of convenience and necessity takes precedence over the franchise of a local government. Except in a few states where the legislatures still believe in home rule and do not comprehend the social significance of ineffective local regulation, the retrogression of local utility regulation is nearly complete.

Chapter 4

State Commissions

STATE UTILITY commissions originally were created to regulate railroad companies. About the middle of the nineteenth century some railroad commissions, which had little more than advisory powers, were established in the New England states. Farther west, where the first generation of grain and livestock farmers hoped for low freight rates, the Granger states waited longer and then endeavored to be more forceful in their control of railroad companies. In the Granger country the "strong" or mandatory commission did not appear until after the Civil War; it did not appear until public trust in competition as a controlling force for railways was given up, and until an accumulation of grievances, some the fault of the railways themselves, such as price discrimination, and some the consequence of the severe depression of the seventies, gave force to the attack on railroad companies. Yet the emotional forces behind the Granger movement waned, and the regulation became temperate. Later in the nineteenth century federal regulation of railroads began to develop; the Interstate Commerce Commission took over most of the regulatory work that once was handled by state regulators. And if the state legislatures had not found other utility industries to control, the state utility commission probably would have passed out of existence.

After the first decade of the twentieth century, when state legislatures began to substitute state regulation for local utility controls, the state commission was the common regulator of prices, earnings, service, accounting, and financing of utility industries other than railroads. But state control of gas, electricity, telephone, water, and local transportation industries did not appear as soon as the weaknesses of local regulation were apparent. In most communities the ineffectiveness of control was evident long before 1900. The limited regulatory ability of local authorities, a shortage of funds for regulatory work, the growing economic power of utility companies, expansion of some firms beyond municipal limits, and defectiveness of the franchise as an instrument of control—these were common limitations of local regulation before 1900. Yet the local governments did not want state commissions. Resisting the loss of their regulatory powers, local authorities delayed the establishment of state commissions. Even if they knew their own shortcomings, local authorities naturally did not want to concede any loss of power, any deletion of their home-rule rights. Even if the utility companies, lobbying against the creation of state commissions, clearly showed a preference for local control and a fear of state regulation, the municipal authorities still wanted their regulatory powers.

A LAGGING DEVELOPMENT OF REGULATION

Not only is the Supreme Court slow to extend public utility regulation to additional industries, but also the legislatures are slow to expand commission authority over the companies. Commissions do not have unlimited authority to regulate: some of them may have enough authority to solve the pressing current problems, but their powers do not extend to the solution of all possible problems. As regulation begins to develop, the legislature does not give the commission authority over every phase of the activities of utility companies; the managers retain some control, usually a large measure of control, of the practices and objectives of their firms. Just as the liberal tradition restrains the Supreme Court from giving a larger scope to the public utility concept, so this individualistic tradition, this respect for the privacy of business and property is an outstanding limitation of the growth of state control. A company must be given an opportunity, perhaps many opportunities, to prove that its own managers can respect the interests of society. Private management, in which public authorities always seem to have a persisting faith, is trusted to act in the public interest until much evidence of a misplaced trust accumulates. At first the private managers are trusted to set up accounting systems, to make reasonable expenditures, to erect capital structures, to determine dividend payments, to choose the technical improvements and the limits of plant expansion, or even to select the prices for new kinds of service. A company is allowed to make accounting, financing, expansion, and pricing decisions as long as its conduct seems to be tolerable.

Legislatures do not delegate additional powers to utility commissions as soon as the intolerable conduct of private management is apparent. A case must be built up for expansion of regulatory authority and for further restriction of private management. That case contains facts about the past conduct of the companies, facts which accumulate year after year until an indubitable record of misconduct is compiled. But a factual record alone often is not enough to provoke legislative expansion of the regulatory authority. The public frequently must take the accumulating grievances to its heart, commonly building a strong political movement for revision of the governmental controls. If significant regulatory changes are achieved in American politics, a spirited populace often must demand them and fight for them. Important changes in our democratic life commonly are backed up by an insistent, even an angry populace. This emotional force behind utility control is always cumbersome and frequently unpredictable; the course of regulatory changes is marked by fitful starts and sudden stops. As Ascoli says,* "Lacking a point of equilibrium, American political, legal, or constitutional life appears either as a whirlwind of facts and data, or as a desperate stagnation. . . ."[1]

The character of the ordinary state legislature puts a further limitation on the effectiveness of utility regulation. A state legislator, to whom service in the legislature is likely to be a temporary experience, usually is not trained to be a legislator. He may be a county seat lawyer, a farmer, a small businessman. He may be acquainted with the general life of his locality and his state, but he probably has only limited knowledge concerning the conduct of utility companies and the possible improvements of regulation. When he confronts bills to expand the authority of the commission or to provide funds for its operation, this legislator looks at the assembled evidence, considers the reactions and arguments of fellow legislators, and takes stock of his own experiences and opinions. Perhaps he votes for stronger control because he does not like large and impersonal corporations; perhaps he is guided by an individualistic heritage and votes against regulatory improvements, even if he is an obscure farmer or the owner of a small business. State legislatures, furthermore, are typically one-session affairs, meeting for three or four months every two years. Since many bills are considered during a brief session, only a small amount of study can be given to public utility legislation. Few legislators ever have time to become acquainted with the nature and purposes of the public controls. Consequently the typical state legislator is not stirred to action against utility firms unless some extraordinary condition, such as long-standing and intolerable practices of companies or the pinch of utility prices and practices during a depression, attracts general public attention and provokes an investigation.

Nor do the commissioners constantly press the legislature for more authority and strive to make the most of their available powers. A commission can become so firmly attached to certain purposes and procedures of control that the study of new objectives and experimentation with new regulatory methods is neglected. Like any other organization in our society, a commission acquires some inflexibility as it ages. And a regulator often wants to avoid constant conflicts with utility companies.

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* Quoted by permission of W. W. Norton & Company, Inc., from *Intelligence in Politics*, p. 138.

Reliance on conventional standards and a quiet administrative life are preferable to the turmoil of frequent regulatory changes. Finally, commissioners often come to their work with neither a knowledge of regulatory history and regulatory problems, nor a substantive background with which they can do intelligent reasoning immediately. Such men can scarcely know what they should ask of the legislature. And after he stays on the commission a few years, this kind of regulator frequently is replaced, either because one term is all he wants or because another political party acquires power, by another commissioner who is likely to be unskilled, too, in the work.

THE EXPANSION OF STATUTORY POWERS

Although fragments of state control appeared during the latter part of the nineteenth century, most state regulation of the utility industries other than railroads started after 1900. In 1859 the office of Inspector of Gas Meters was created in New York, and in 1891 the Board of Rapid Transit Commissioners was established in New York City by the state legislature.[2] The first commission with state-wide authority was established in Massachusetts. In 1885 the Massachusetts Board of Gas Commissioners was created, and two years later regulation of electric companies was added and the title of the board was changed to the Board of Gas and Electric Light Commissioners.[3] Control of prices, quality of service, and the entrance of new firms were the principal powers of the board. This early regulation in Massachusetts did not grow out of the complaints of buyers. Rather, the existing gas and electric companies, seeking protection of their markets and investments, wanted a commission so that the entrance of new firms could be prevented and the pricing effects of competition could be avoided.*

The Early Period. Except for Massachusetts, no state started general regulation of utilities until laws were passed in New York and Wisconsin. In 1905 a joint legislative committee in New York, which was created because Mayor Seth Low discovered collusive bidding on gas franchises in New York City, recommended state-commission control of gas and electric companies. The Commission of Gas and Electricity, an advisory type of commission, was installed in 1905 and was used ineffectively for two years. When Charles Evans Hughes, an advocate of forceful control of utility companies, became governor, two public service commissions were created. One of them, apparently a concession to home-rule interests, controlled companies in the New York City area for many years. And the other one, known as the Second District Commission until the two commissions were united, had jurisdiction over companies in the remainder of the state.[5]

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* Utility regulation in Massachusetts showed more consideration for private investors than any other state regulation in the country. Trying to protect the equities of investors, Massachusetts commissioners always regulated the financial transactions of public utility companies. Restriction of competition was another part of the Massachusetts policy. The act of 1885 gave the Board of Gas Commissioners the right to veto duplicating franchises. In 1891 a further statutory restraint was placed on utility competition: when a city undertook municipal ownership of a utility plant, it was required to buy the private plant at a court-determined price. And during the early years of regulation a company representative was a member of the commission; a company member, a public member, and a middle-of-the-road or "safe" member made up the commission.[4]

After a long investigation of public utility regulation was finished, the Wisconsin legislature also gave its Railroad Commission extensive control over electric, heat, water, and telephone service in 1907. A part of Governor (Old Bob) La Follette's program for business regulation, this law provided strong control of utility companies and started the Wisconsin Commission toward an illustrious regulatory record. It became the pattern for many other state statutes. Like other pieces of the La Follette program of public regulation, the public utility statute was a remarkable legislative act for its time and deserved to be copied. Investigations of rates and service could be made on petitions of buyers or cities, or they could be made on the initiative of the commission. The commission had authority to fix reasonable rates and reasonable standards of service, to make property valuations, to prescribe uniform systems of accounts, to audit company records, and to fix rates of depreciation for utility properties.[6] But some powers were not granted to the Wisconsin Commission in 1907. Several omissions, surprising for the foresighted La Follette government, were important: the commission did not have control of security issues, corporate reorganizations, dividend payments, and other financial matters.

Because agitation against utility companies was widespread, about thirty states passed laws before 1918 that created commissions and provided regulation of one or more of the "local" utilities. And by 1920 more than two-thirds of the states had commissions that controlled one or more kinds of utility firms other than railroad companies. This was a period of spirited public insistance on controls; small, defenseless buyers demanded and were given protection against monopolistic practices. This was an era of extensive expansion rather than intensive improvements of regulation. Throughout the country the state legislatures extended commission control to street railway, water, telephone, gas, and electric companies. But refinements of regulatory objectives and techniques were delayed for ten to twenty years in most states; they were put off until the commissions acquired experience and knew more about the desirable and permissible limits of public control.

The Twenties. The lively extension of state commission authority over public utility firms, other than railways, slowed down sharply during the twenties. Not only was the emotional force behind the first stage of utility regulation spent, but also the thriving business activity of the twenties deterred expansion of authority. In this climactic decade of our capitalism the small buyers, who backed up the previous regulatory movements, were employed and had enough income to pay their utility bills easily. State legislators, too, were content with a prospering capitalism. And by this time the utility companies developed lobbies, customer relation policies, and publicity; they were able to combat advances in public control. Trying to shape public opinion, the companies established information bureaus; buying advertising space in newspapers, printing pamphlets, and making speeches, they told the populace about efficient private production of services, deplorable public ownership of utility plants, and socialization of the country if regulation was extended into the inner sanctums of utility firms. Finally, the state commissioners were not always aware of the prevailing practices of utility companies; they did not always recognize the need for more vigorous action. The decade was nearly finished, in fact, before both the legislatures and commissions seemed cognizant of holding-company practices, irresponsible issuance of many securities, careless accounting practices, and excessive earnings of many companies.

The decade of the twenties was not a period of complete stagnation in regulatory action. Commissions obtained valuable experiences in earnings, price, and service control. Even if their efforts often were crude and erratic, the commissions did effect some financial regulation, price reductions, and service improvements. Commissioners harried the companies, even though they did not prevent overcapitalization of some companies, control price structures carefully, and eliminate excessive earnings. To protect their earnings against commission regulations, companies were forced to go to the courts more often than they did before 1920. At least utility controls were used enough during the twenties to create a property valuation controversy—to raise the question of whether a firm should get a return on the original cost or the reproduction cost of property. And a few commissions, like those in Massachusetts, Wisconsin, and California, practiced respectable control of financial matters, restricting the issuance of new securities and exercising some control of corporate consolidations and mergers.

Depression-time Changes. Disturbed by depression conditions and forced to abandon their complacent attitudes, legislators and commissioners undertook regulatory improvements during the thirties. Several commissions, long confined to a meaningless control of railroads, were authorized to regulate all utility companies. A belated expansion of authority occurred in Arkansas, Kentucky, South Carolina, North Carolina, and Utah. And old commissions obtained new powers; general revisions of authority were made in about a half-dozen states. Many commissions obtained authority to regulate the relations of holding and operating companies. State-commission control of affiliated-company transactions began when a New York statute was passed in 1930; within a few years about twenty legislatures passed similar laws. Regulation of financial matters also improved; some commissions had authority to control security issues for the first time, and others received additional controls of utility-company finances. Some commissions obtained more authority over rates. Even a few commissions were given more specific controls of common-stock dividends, accounting practices, and measurements of depreciation expense.[7]

The depression conditions put new life into the commissions, making them more alert and provoking more investigations of managerial practices and earnings. Indulgent commissioners were replaced by lively and sometimes well-informed regulators. Commissions studied ways to improve and to expedite regulation, took more decisions away from private company managers, and applied their available powers more vigorously. They began to give more attention to fact finding, commenced to emphasize the administration of regulation and to abandon the judicial attitude that was dominant before 1930, and started to study financial, service, and price matters as economic and social problems rather than legal problems. Seeing the results of inadequate financial regulation such as overcapitalization and poorly arranged capital structures, commissions frequently took over the control of corporate consolidations, property acquisitions, security issues, and accounting systems. And more of them aggressively regulated utility rates during the depression years, turning excessive earnings into many rate reductions for consumers.

THE NATURE OF COMMISSION CONTROL

Nearly all states now have commissions that exercise some control of utility industries other than intercity railway and motor carriers. But all commissions, as shown in the following list, do not control every kind of utility company:[8]

	Number of States with Control
Telephone Companies	45
Gas Companies	42
Electric Companies	41
Street Railways	40
Water Companies	36
Steam Heating Companies	30

Even though utility regulation is common throughout the United States, some states do not control all utility industries other than intercity transportation; all gas, electric, telephone, water, and urban transportation companies are not regulated by state commissions. Delaware is an outstanding case; no kind of utility service, not even intercity transportation service, is controlled in Delaware. In two states, Iowa and Florida, there is no general state regulation of telephone, gas, electric, water, and urban transportation companies; some commissions (Minnesota, South Dakota, Texas, Mississippi, and Nebraska) control only one or two of these utility industries; home-rule cities regulate electric companies in Colorado; and the Ohio regulation is divided in a special way between the commission and cities.

Independence of the Commissions. Public service commissions (or railroad commissions as they still are called in several states) generally are devoted exclusively to utility regulation. In nearly all states they are independent of other branches of state government; only the courts can review their decisions. A half-dozen states have another policy: the public utility regulation is done by a state agency which has authority to handle several governmental functions. Some of these commissions, as in Oklahoma and Arizona, are called corporation commissions.

When public utility regulation is administered in conjunction with other governmental functions, it loses some of its traditional governmental independence. It is placed under a state official who is directly responsible to the governor, and is integrated politically with the governmental organization. Although regulatory costs may be reduced by eliminating an independent commission, the main reason for the change seems to be the unification of state administrative government. Being an administrative agency, the commission is placed under the state's highest administrative officer, the governor. This is what government students like to call "responsible" government. As these students apparently understand it, responsible government consists of expeditious procedures, a unified organization, and lines of authority radiating from the governor's office. Yet the elimination of an independent commission does not provide better utility control unless the governor is a wiser, more vigorous regulator than the commissioners are. Although state regulation of utility companies needs improvements, abandonment of independent commissions is not a sure way to achieve them.

A Combination of Functions. A utility commission has more than administrative functions. Operating in a manner that is contrary to the basic American pattern of government, it combines the functions of legislator, administrator, and judge. When a commission prescribes certain rules of conduct for utility companies, it is legislating. State legislatures give the commissions an opportunity to prescribe rules of conduct. The legislatures delegate powers to the commissions, and allow the commissions to determine how the delegated powers shall be interpreted and applied. Commissions are given general authority, for instance, to regulate and to prescribe accounting practices. The administrative and judicial functions stand out even more prominently than the legislative function. Investigating and prosecuting the companies under their control, commissions perform important administrative functions. Holding hearings, examining evidence, and making decisions, they are judges of utility-company conduct.

Being different from the traditional form of American government, this combination of functions of a utility commission is criticized by some students.[9] Naturally the companies, seeing an opportunity to lighten their regulatory burden, like to condemn the breadth of commission powers. The jointness of functions cannot be denied. Unlike the separation of the legislature from the governor in state government, a utility commission can fix the rules that it wants to administer. Criticism is focused, however, on the combination of prosecuting and judicial functions. On the one side, the commission decides to prosecute a company and gathers evidence against the firm; on the other side, it considers its own evidence as well as the evidence of the company and makes a decision. Combining the functions of prosecutor and judge, the commission seems to be breaking the rule that no one should judge his own case.[10] Certainly it cannot easily make an impartial decision when it is both prosecutor and judge of the case.

If the three functions of the ordinary commission are split up, regulation is weakened. Let us suppose that the regulators devote all their energy to judicial decisions of cases, while factual investigations and rule making are left to other organizations. Since the commission acts strictly as a court in this imaginary situation, the buyers or cities or some special government agency must assemble and present the information on which the consumers' case rests.[11] Lacking an organization, buyers cannot finance an investigation and the presentation of necessary facts. Nor can most municipal governments, as the record of utility regulation demonstrates, present a good case for the consumers. An office of consumers' or people's counsel, working exclusively for the consumers, can be established to prosecute the utility companies. But such a consumers' counsel, which has been used with indifferent success in a few states,[12] does not assure effective regulation of earnings and prices.* Furthermore, either the legislature or some administrative agency must prescribe detailed rules for certificates of convenience and necessity, accounting systems, expenditures, corporate consolidations, sale of securities, and numerous other matters. Accounting, financial, and other problems are not sufficiently standardized for a simple job of rule making. Indeed, all three functions—the functions of legislator, prosecutor, and judge—come so close to each other in utility regulation that they can be handled most efficiently by a single agency. At any rate, the real test seems to be the regulatory achievements rather than the form of commission organization.

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* Other divisions of regulatory functions are suggested: (1) one agency can assemble information and prosecute cases while another decides the cases, (2) the staff of a commission can be sharply divided into investigating and prosecuting sections, or (3) a separate administrative court can hear and decide commission cases.[13]

Sometimes commissions have preferred to act in a judicial manner; at other times they have emphasized administrative work and have concentrated their attention on investigation and prosecution of cases. During the twenties many state commissions, lacking funds for extensive investigations, tended to handle regulation more in a judicial than in an administrative manner. They frequently waited for buyer or company petitions before they initiated rate investigations; or they neglected financial and accounting regulation, because the buyers and investors did not demand it. Companies benefited in two ways from the judicial form of control: they were not subjected to frequent investigations, and the buyers or cities could not gather and present facts easily. After commissions were rejuvenated during the thirties, the administrative function became more important. Initiating most of the investigations, regulators gave more attention to collecting and analyzing factual information. Their defense of buyer interests was more vigorous than it was before 1930.

Statutory Powers. Three-quarters of the commissions control the entrance of new companies, and determine the service area of each firm. Commissions exercise this power through the issuance of certificates of convenience and necessity. Lacking one of these certificates, which is about the same thing as a municipal franchise, a company does not have a right to perform utility service. These certificates are used to prevent or to limit the competition of companies, to fix service limits of each company so that little or no overlapping occurs. Commissions did not fix exact service areas, however, prior to the expansion of utility industries. These service areas usually were worked out gradually through the expansion and consolidation of companies rather than the forehanded planning of the regulators.

Some commissions have special powers of rate regulation that include control of temporary rates, suspension of rates, and refunds. But all of them, as shown in the following table,[14] have general controls of utility rates. All commissions have authority to prescribe "reasonable"

Kind of authority	Number of commissions	
	Electric	Gas
Initiate investigations	41	42
Certificate of convenience and necessity	29	29
Residential, commercial, and industrial rates	41	42
Prescribe temporary rates	23	23
Establish service standards	40	41
Prescribe uniform systems of accounts	41	42
Prescribe annual and other report forms	41	42
Prescribe method of depreciation accounting	38	39
Issuance of securities	31	30
Lease or sale of property	36	34
Mergers and consolidations	35	33
Reorganizations	28	27
Contracts with or payments to affiliates	30	31
Loans to affiliated interests	25	25

rates, and to prevent (or limit) discriminatory pricing. Sometimes the statutes specify that utility companies shall receive fair returns on their property values. This specification is the common legal standard of earnings control: reasonable earnings are measured by multiplying the fair property value by a fair rate of return. The legislatures usually give the commissions almost unlimited authority to control the investigations, hearings, and decisions of earnings and price regulation. And unlike the local governments, which rely on franchise negotiations, the state commissions investigate and order rate changes as frequently as they are needed; rates are not fixed for some definite future period of time.

Determination of service policies is a counterpart of price and earnings regulation. Commissions can prescribe service standards; they can fix the quality of the output unit such as the voltage of electricity, the heat content of a cubic foot of gas, or the purity of water. In addition the state regulators commonly can order service extensions within the limits of the service area of a company, and can deny or restrict the abandonments of service.

All commissions have some control of accounting practices. Given this power, a commission can prescribe state-wide uniformity of accounting systems. Or it can adopt a nation-wide system of accounts which a federal commission or the National Association of Railway and Utilities Commissioners draws up. An accounting system, classifying accounts and specifying the proper uses of accounts, is a necessary part of effective regulatory action. It is an indispensable source of cost, revenue, and property value information. After utility companies fixed some accounting practices before 1935, commissions learned the hard way about the need for close accounting regulation. They learned that, unless accounting practices were carefully prescribed and supervised, the book valuation of assets, accounting for depreciation, handling of financial transactions, and operating expense accounts could be manipulated by company managers. Now each of the state commissions prescribes uniform systems of accounts—uniform classifications of accounts and standard accounting practices. The two most important characteristics of these revised controls are the book valuation of property (commonly the cost when the property was first devoted to public utility service), and annual charges to depreciation expense (computed usually in a straight-line manner) that charge off the depreciating investments before the plant retirements occur.

About three-quarters of the commissions have another kind of authority that is a necessary part of proficient regulation: the right to regulate the issuance of securities. Having control of security issues, the commissions can regulate the total capitalizations of companies—the total amounts of outstanding securities, and the shapes of capital structures—particularly the proportions between debt and stock securities. A slightly larger number of them control the leasing, merging, and consolidation of utility properties. And some of them have authority to control dividend payments to common stockholders, even to stop the payments altogether; they can check the acquisitiveness of the voting stockholders. Yet when the utility companies expanded rapidly and issued large amounts of securities, state regulators did not exercise all their powers over financial transactions. The shortcomings of utility-company finance were revealed during the thirties, and the commissioners began to use their financial controls and to ask legislatures for more authority.* By this time, however, the Securities and Exchange Commission was an aggressive regulator of the finances of utility companies, and the full exercise of state commissions' powers was not necessary.

Size of the Commission. Most commissions have either three or five members.[16] But Oregon has a one-man commission, and North Carolina has only one full-time commissioner. When a commission has three or more members, the decisions reflect the balanced judgments of the group; when a single commissioner controls regulation, the decisions are subject to the whims, biases, knowledge, and vigor of one man. If a state has only one commissioner, the efficiency of regulation obviously depends on the choice of a single man; all the eggs are in one basket. Relying on one man, a legislature abandons the traditional judicial pattern of commission organization; it substitutes the administrative authority of one man for the judgment of three or five commissioners. Yet, when a commission has several members, the control can be confused and even inefficient, because the several commissioners have different training, experiences, and temperaments. Compromises on regulatory policies are common among these commissions. Just as too many cooks can spoil the stew, so too many commissioners can disturb the effectiveness of utility regulation. A chairman of the Massachusetts Department, who was forced to consider the different views among his fellow regulators said,

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* Regulation of affiliated-company transactions now is a common power of state commissions.[15] The controls cover loans to affiliates, prices of management services, and disclosure of stockholders who have one or more per cent of the voting stocks.

> In the Worcester case I was gunning for Goldberg's vote. He wanted to get some of Brandeis' stuff in. Wells joined us on the rate. Somebody else, I forget who, joined us on the value. I didn't care about their views; I wanted to get a finding. The point is that we cut the rate from 7 to 5 cents.[17]

The Commissioner. Commissioners are elected by the voters or appointed by the governors in nearly all states.[18] The main exceptions are Virginia and South Carolina where the commissioners are chosen by the General Assemblies. Popular elections are poor ways to choose the regulators, because voters do not know much about utility regulation and the necessary qualifications of able commissioners. A political advertisement that the "commission should serve the people or be abolished" or that "Jones on the Commission is a pledge of a square deal for all" can scarcely be very meaningful.[19] Yet similar statements are used by the candidates as they campaign for votes. Sometimes, too, the candidate who attacks the utility companies most vigorously is the victor.[20] If candidates must make senseless statements to the voters and debase themselves in other ways, the ablest men do not run for the commissionerships. They leave the political race to the men who want simply a political office. One former state regulator says that the "majority of those seeking it [the commissionership] have not the slightest idea of the duties and responsibilities of the office. It is, to them, just six years at a salary of $5,000 a year." [21]

On the other hand, governors do not always choose the ablest commissioners or keep their appointments free from politics.* When their political organizations need patronage, governors do not search for the best possible regulatory talent. Most governors apparently think of regulation as a political function, as a way to serve political parties and political helpers. If a man works hard for the "party," promises to be useful to it in the future, has or can create the respect of voters, and is on the "right" side of public issues, the ordinary governor seems to consider him a fit candidate for the public utility commission. Consequently the state commissioner often is a faithful member of the victorious party, and the commissionership is a reward for political work and political position. Governors do not ignore the need for capable regulators; they are not indifferent to utility regulation. But they do not put regulatory achievements ahead of all other political considerations. Thus the regulatory ability of an appointed commissioner often is secondary to his general political stature.

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* One regulator has said, "We have had commissioners in the western country who were appointed or elected for the sole purpose of raising hell with the electric power companies. . . . Politics is behind it." [22]

The statutory qualifications of a commissioner do not closely restrict the choice of possible candidates. Customarily they concern the right to vote, state residency, and present relations with utility firms. In approximately half the states the commissioner must be a qualified elector; a few states require a residency of as much as five years. Nearly all the state statutes specify that no employee, officer, or agent of a utility company can be a member of the commission, and that a member of a commission cannot have a financial interest in any utility firm. But after his term of service expires or after he resigns, a commissioner can be hired by a utility company in most states. Less than a fifth of the statutes put any limitation on a commissioner's political activity during his stay in office. A still smaller number of statutes forbid commissioners to hold other political offices as soon as they cease to be regulators. If all state commissioners were denied opportunities to hold other political offices at any time or until five or ten years elapse, fewer professional politicians and more expert regulators would be members of commissions. Or if the commissioners were required to have some expert knowledge of regulation prior to their appointments or elections, the effectiveness of commissions probably would be improved. But restrictions on political activity and requirements of expert knowledge are unrealistic in American government.

A Common Man's Commissioner. Knowledge of regulatory problems is not a common qualification of commissioners. Several state statutes specify that a lawyer, an engineer, or even an accountant shall be a member of the commission. Yet even such a specification of professional training is uncommon. Legislatures do not demand expert commissioners; they rely instead on men who have respectable general knowledge and can exercise "good judgment." Adhering to a democratic precept, the legislatures believe one citizen is as good as any other.[23] Since all eligible voters are treated alike at the polls, all citizens are qualified, too, for the jobs of regulating public utility companies. A preference is shown for a common-man regulator, a man of ". . . character rather than intellect—consistent, and averse to highfalutin' deviations."[24] * Even if the performance of expert commissioners promises to be far better than the achievements of the regulators who are drawn from the ranks of common men, the legislatures do not rewrite the statutory requirements. Like the populace which put them in office, the legislators often accept fumbling commissioners rather than place their trust in the experts, the dispassionate "thinking" men.

Dependence on the common-man commissioner, whose principal qualifications are good judgment and good character, follows the tenets of democratic government. It weakens state regulation of utility companies, but it conforms to American political traditions. These men with common-man connections or common-man personalities often are anxious to regulate. But they lack knowledge of the history, means, and ends of regulation. After they become members of commissions, they must learn the prevailing commission procedures, accounting controls, many variations of legal thought, and possibly a bit of economic reasoning. Their limited dexterity is pitted, meanwhile, against the expertness of utility company management. Unlike the legislature, the utility firms hire numerous experts to tell them how regulation can be dodged. Consequently the modest statutory qualifications for state commissioners seem to serve the interest of utility companies more than they serve the democratic ends of government.

A common-man commissioner can hire experts, of course, to gather facts and to give him advice. Yet such a man does not always hire or even want to hire expert assistants. If a commissioner does not know what expertness in regulation is, how can he acquire expert staff members? He must know his accounting problems and something of accountancy before he can choose expert accountants; he must think carefully about his problems before he realizes that, in place of legal advice, he frequently needs economic analysis. Another consideration restricts this man's employment of experts: he is likely to be suspicious, as common men often are, of the objective reasoning and quick answers of the intellectuals. It is not quite safe, he thinks, to be guided by the impersonal reasoning of the experts. Unlike the professional accountant or economist, the common-man regulator is distrustful of innovations and experiments —proposals that studious men can readily conceive and can express in a strange language. This man feels safest when he follows established regulatory customs. So, even if a common-man regulator really is anxious to regulate, his aversion to experts and innovations inadvertently places him on the side of the utility companies.

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*Quoted by permission of Little, Brown & Company from Carl J. Friedrich, *The New Belief in the Common Man*, p. 41.

If state regulation of utility companies ever becomes respectable throughout the nation and if state governments avoid federal usurpation of their regulatory authority, then the state legislatures must improve the ability of the typical commissioner. Knowledge of the dimensions and devices of utility regulation must be the prime, even the sole requisite of a commissionership. State utility regulation must become a career—a technical rather than a political one—as it has been at times for commissioners in Massachusetts, New York, Wisconsin, and California. Looking toward this end, the state legislatures can rewrite the qualifications of commissioners, giving much weight to knowledge of regulatory practices and purposes. At any rate, the governor's choice of qualified candidates can be limited, either by statutory qualifications or a nominating board of some sort, to men who are better qualified than the average voter. More regulators need to be drawn from the staffs of commissions; for the staff members often have more regulatory experience and knowledge than that of the present commissioners. If regulatory proficiency is desired, commissioners can be hired, too, from other states. What difference does residence of the member make as long as regulatory ability is desired? Yet, as Mosher observes,* "Parochialism, whether state or local, is nothing less than a chronic disease of the public service in this country." [25]

Tenure and Salary. The commonest term of office for commissioners is six years. Only two states, New York and Pennsylvania, have ten-year terms for their utility commissioners. Even a term of six years, a fairly long term by American political standards, seems barely adequate when regulators commonly must educate themselves after they come to the commission. If three or four years elapse before a regulator becomes well informed and efficient, the state should not lose him at the end of a six-year term. Perhaps he can be re-elected or reappointed. But most men serve only one short term. In 1935, for instance, the incumbent commissioners of all states had served an average of slightly more than five years.[26] A long service period for regulators, like the enduring tenure of some past Massachusetts commissioners or the members of the Interstate Commerce Commission, is a way to improve state utility controls. But as long as American politics is erratic and unreasoning and as long as the common-man standard for regulators is in force, the term of office for state commissioners is certain to be brief.

The average salary of commissioners is slightly more than $5,000 a year. In New York they receive $15,000 a year, and the New Jersey salary is $12,000. In several other states the commissioners receive annual salaries of $6,000 or more. On the other hand, some states pay very modest salaries for what is supposed to be expert and wise public work. In these states, where utility regulation generally seems to be weak and irregular, the commissioners are paid no more than many clerks receive from the federal government. Many of them work for $5,000 or less a year. In North Dakota the annual salary of commissioners is $3,300. And in Vermont, where the lowest annual salary is paid, members of the commission, other than the chairman, receive only $2,000 a year.

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* Reprinted by permission from Chapter 5 by W. E. Mosher in Graham and Reining, *Regulatory Administration,* published by John Wiley & Sons, Inc.

Observing the low salaries of state commissioners, students of public utility regulation who want to improve state control propose higher salaries. The salaries of $5,000 or less a year are unlikely to attract excellent men. But the payment of higher salaries does not assure the selection of more proficient regulators. Too much is still dependent on the appointive power of the governors or the elective power of the voters. Neither the governors nor the voters are certain to choose better commissioners because the salaries are increased. Looked at in a different way, the present salaries often are too high rather than too low; since they are poor regulators, some men are not worth the low salaries that they receive. Governors do not always survey all possible candidates and try to get the best regulatory talent for the salaries. Unless technical qualifications are carefully specified by the legislature or unless governors are more discreet in their appointments, an increase in salaries probably cannot improve the effectiveness of utility regulation except in the states where the salaries now are below $3,000 a year. The higher salaries are likely to go to more successful politicians rather than more expert regulators.

Commission Organization. The organization of a state commission usually is divided into legal, accounting, engineering, and other such departments, not separate departments for each utility industry. Some of them, however, have a mixture of functional and industry departments. The Illinois Commission, for example, has the following sections: executive, administrative, engineering, accounting, rates and research, transportation, motor vehicle, and warehouse.[27] Although the organizational division of labor varies from commission to commission, emphasis is placed customarily on legal, accounting, and engineering work. After the depression of the thirties disturbed regulatory work and started new ways of price and financial regulation, some commissions gave more attention to economic research, to the sort of work that is handled now by the rates and research sections of the Wisconsin and Illinois Commissions. Economic analysis is essential to policy making in utility regulation, whereas accounting regulation, which usually receives much more attention, is a matter of methodology—indispensable but still concerned mainly with procedural problems rather than the purposes of control.

Economic analysis can be used to solve many of the problems of earnings control, pricing practices, extensions and abandonments of service, or some questions of security regulation. The usefulness of economic analysis is illustrated by the experiences of the Illinois Commerce Commission. Shortly after the rates and research section of the Illinois Commission was established, an economist, who later became the administrator of the Bonneville Power Project, was hired to run it. This commission, which never was known for competent regulation, soon became more proficient. The Illinois Commission approached the regulatory standard that the Wisconsin Commission fixed many years before.

When commissions acted more like courts than administrative organizations, the selection of expert employees was not considered an essential part of a regulatory program. In deciding cases, commissions did not always rely on their own evidence, but could use that presented by the companies and consumers (or local governments). Now they gather the evidence with which the buyer side of a case is supported. Emphasizing fact finding and aggressive administration of regulation, commissions need clerks and expert employees. If the control is well done, key employees must be well chosen; they are needed for intelligent fact finding and advice. Today a successful commission often has staff members who know considerably more than the commissioners themselves about utility regulation.

Good commission staffs are not built up with low salaries. The New York Commission, for instance, pays the directors of its accounting and research divisions $9,000 a year. Such a salary is high enough to attract experienced and skilled staff members, to give a commission men who can stand up to the skilled employees of utility companies. Although the Wisconsin Commission usually has a good staff of experts, it does not pay salaries as high as those in New York. Perhaps this is the reason why Wisconsin Commission employees often shift to federal government jobs. The salaries of the leading staff members of the Wisconsin and New York commissions are far higher than the salaries that most commissions pay. In 1935 (the latest date of any detailed study) the average salary for administrative, engineering, and rate research employees of thirty-five commissions was about $2,500.[28] For such a nominal salary a commission can hire and keep some inexpert employees. But if a staff member is competent, he soon moves on to a better position; even an obscure clerk often receives $2,500 or more a year from the federal government.

Funds for Commission Control. No commission can go far without a staff to gather facts and to handle some of the supervisory work. Funds for regulatory expenses must be available. In many controversies the commissions are confronted by companies that are willing to spend freely for technical advice, collection of facts, and a strong defense against adverse decisions. If they themselves are denied funds with which the necessary experts and clerical employees can be hired, the utility companies can escape from some regulation. Actually, the available funds for state utility regulation are not large. In 1928 the total expenditures of thirty-three commissions were almost $6,000,000; in 1934 the total expenditures were $7,735,000;[29] and in 1937 the cost of state regulation was $8,027,000.[30] For a number of years the New York Commission spent about a million dollars a year. At the same time the California and Wisconsin Commissions did excellent work with expenditures of half or less than half the New York costs of regulation. Respectable control does not depend altogether on large expenditures. Yet many commissions have less than $100,000 or even less than $50,000 to spend each year; regulation naturally is weak in these states.

Even if their members are well trained and experienced, commissions in many rural states do not receive enough funds to perform their regulatory tasks creditably. Lacking funds, they cannot hold more than a few sizable hearings each year; they cannot undertake continuous supervision of utility companies. Furthermore, these small commissions, compared with the large ones, incur some diseconomies of size. Even if funds were available, the small volume of regulatory work limits their ability to hire expert staff members. The small commission encounters the same general cross section of regulatory problems that a large commission faces. It needs the same expertness as a large commission in legal, engineering, accounting, and economic work. This kind of commission should spend $5,000 or more a year for its department heads, and substantial salaries for lesser lawyers, engineers, accountants, and economists. But these salaries—the overhead costs of regulation—are spread over a few units of regulation. If the quality of regulation is to be uniform from state to state, the unit cost of it is highest for the small commissions. Like the production costs of utility service, the costs of regulation can be economized with large-scale operations.

Assessments of Regulatory Costs. For a long time the commissions relied on legislative appropriations for their funds. Usually the legislature, which probably created the commission without thinking much about regulatory costs, was not very generous. Pressed for funds, the commissions looked to other ways to finance their regulatory work. Some of them were authorized to assess the regulatory costs to the utility companies. Either the costs of particular investigations were assessed against individual firms, or a general assessment was made against all companies. Between 1920 and 1930 some costs of regulation in twenty states were assessed to utility firms.[31] And after 1930 assessments became a common means of financing the state commissions.

The same regulatory costs are not assessed against utility companies in all states.[32] Costs of earnings, price, property valuation, and accounting investigations most commonly are charged to the companies. These special costs of regulation usually are billed directly to the firms for which they are incurred. In some states a statutory maximum (e.g., one-half of 1 per cent of the gross intrastate revenue in New York state) is fixed for the special annual assessments of any company. In some states the general expenditures of the commission also are assessed to the firms that are subject to regulation. Sometimes all expenditures are charged to the companies; in other states only a part of the general expenditures, such as commissioner salaries in Wisconsin, are assessed. These general expenditures ordinarily are prorated according to the gross intrastate revenue of the companies. And a statutory maximum (e.g., one-fifth of 1 per cent of intrastate revenue each year in Wisconsin) is fixed for the general assessments against any firm.

Assessment of regulator costs was upheld by the Supreme Court in 1937.[33] The case concerned the assessment law in the state of Washington, a law which required all utility companies, including railroad companies, to pay an annual fee of one-tenth of 1 per cent of their gross revenues. The Great Northern Railroad charged that the act was unconstitutional, and based its case on the fact that the Washington Commission spent less on the regulation of the company than the firm was required to pay. But the Supreme Court did not find that the total assessments were higher than the legitimate costs of regulation. And it did not hold that the assessment of any company should be measured by the costs incurred to regulate the firm.

Financing regulatory work with the assessment method, a commission has more independence from state government and politics than if the appropriation method is used. When part of the regulatory costs are assessed to the companies, the commission does not rely altogether on the legislature for its funds. It does not compete so much with state institutions and state departments for funds as if legislative appropriations were the only source of funds. Yet for some funds the commissions still are dependent on legislative appropriations. This is true when, as in some states, the assessments supplement rather than supplant appropriations. And appropriations are necessary, too, where the special regulatory costs alone are assessed to the companies. The assessment method has another fiscal advantage for state commissions: where general assessments are made on the basis of the gross revenue of companies, the funds for regulation are likely to be more stable during a depression than with the appropriation method. Tax revenue of a state can decline rapidly during a depression. But the gross revenues of utility companies are less responsive to depression conditions, because many buyers have an income inelasticity of demand for the services. The demand for electricity, gas, water, and probably telephone service declines less than the tax revenue of the state. Taking advantage of the quite stable consumer demand for utility services, the commissions can be free from some financial troubles during a depression.

When legislative appropriations support the state commissions, the cost of regulation is paid by the taxpayers, who may or may not share the benefits of public control. On the other hand, when assessments support the work of the commission, the cost is paid either by the companies or the consumers of utility service, or both.[34] When the commission does not increase a firm's prices after the regulatory costs are assessed, the costs come out of profits. Or these costs reduce the investor's return when price increases do not bring in more revenue; a street railway company, experiencing competition from private automobiles and decreases in demand, cannot be sure of additional revenue just because the prices are increased. On the contrary, the assessed costs of some firms are paid by the consumers. These assessed costs are part of a company's costs of service, and are supposed to be covered by the revenue received from consumers.[35] Commissions may not measure the total costs of the service of each company every time the regulatory costs are assessed. Yet, when the earnings of a firm are investigated, the assessed costs of regulation must be counted among the costs of service. The costs of service and, in consequence, the permissible earnings are higher than in the absence of assessed regulatory costs. Even if the buyers receive price reductions, they still pay these costs because the prospering company is allowed enough revenue to cover them.

Organizational Imperfections and the Future. Although state commission regulation of utility industries is an improvement on what local governments and franchises can provide, it is still, as the organizational deficiencies described here show, far short of good social control. Except for a few states such as New York and California with substantial funds and alertness, or Wisconsin where the progressive La Follette spirit is not yet dead, the organization of state regulation is noticeably static, nonaggressive, and incomplete. State commissions commonly need funds that are partly but still not adequately supplied by legislative appropriations and assessments; the funds for regulation are minute in comparison with the property values and earnings of the companies. Apparently depending on the managers and owners to show an enlightened self-control that is founded more on the old liberal faith than on reality, state legislatures do not keep close tab on their public utility regulation; they are slow to provide more authority, more vigor, more expertness. Even worse, the commissions themselves, who should know the regulatory needs better than the legislatures, seem to be apathetic and do not press for funds, statutory powers, and other means of improvement. Another fundamental weakness of the regulatory organization is the typical state commissioner; he appears more satisfied with things as they are than with good regulatory effects, more interested in his politics than his knowledge and expertness. In general the states are sending nice political-minded boys to do a job that calls for wise and determined men. Unless the states quickly broaden the authority, increase the funds, and improve the men of their commissions, unless many do what only a few have done, they cannot hope to avoid eventual subordination to federal regulation, no matter how much they fret about state rights and deplore the shift of governmental power to faraway Washington. They may already be too late with reorganization plans that can save the once-important place of state regulation; for the new, aggressive, and competent federal control of utility industries is growing rapidly.

Chapter 5

Federal Regulation

FEDERAL REGULATION of public utilities began to grow strong after 1933—after a new political and economic movement, guided originally by President Franklin Roosevelt and called New Dealism, appeared in American government. Some federal regulation of utilities started during the twenties, but it was a moderate and limited control. Before the Democratic party became powerful after 1933, state commissions controlled the prices, service standards, accounting, and finances of utility companies other than railroads. But eventually the weaknesses of many state commissions, the growth of interstate commerce in utility services, and the conduct of holding companies in the gas and electric industries compelled the enactment of federal controls. Federal regulation of utility companies, like Washington government in general, came under the influence of the modern liberalism that recognizes the persistent imperfections of economic order, the social place of extensive remedial activities by the state, and the need for vigorous action against concentrated economic power if the public welfare is to be protected. At the same time the state governments, living more by the old than the new liberalism, continued to rely heavily on private management and were slow to improve the effectiveness of their public utility regulation. For the present Congress intends to supplement rather than to replace state commission control. Congress requires, indeed, that the federal commissions show respect for the state commissions and that they cooperate with the state regulators. Yet the federal commissions are stronger than most state commissions; they are vigorous agencies that have abundant funds for investigative and supervisory work. Being part of the growing federal leviathan, they ultimately may take over some of the present functions of state commissions; they may overwhelm the state commissions with their superior regulatory abilities.

ELECTRICITY

Federal control of private electric companies was directed along two different lines. Conservation of the water power resources of the country was the original kind of federal regulation. This regulation was handled directly by Congress before 1920. Every time a company or city wanted to build a hydroelectric dam on a navigable stream, Congress had to pass a special act. By 1905 the private companies were rushing to obtain dam sites; they requested sites, even if they were not yet ready to build dams. Foreseeing private control of all good locations for hydroelectric plants, some congressmen and President Theodore Roosevelt were alarmed. During this period President Roosevelt, decrying the lack of Congressional control of water power, vetoed several bills for power sites. When he vetoed the Rainy River bill, he called water a "heritage of the people" and spoke of the impending development of water power.[1]

The Act of 1920. Despite the requests of President Roosevelt and the introduction of several bills for water-resource regulation,[2] no federal legislation was enacted until 1920. Then a weak law was passed. To achieve this modest beginning in water-power control, water conservationists had to overcome the force of ". . . one of the most powerful lobbies ever known to Washington."[3] It was a victory, but not a complete victory, for the water conservationists. The Federal Power Commission was created. This commission was composed of the Secretaries of War, Agriculture, and Interior—each of the cabinet officers who previously exercised some control over the use of navigable waters. The commission had a full-time secretary, but investigations were made by the personnel of the Agriculture, Interior, and War Departments. One power of the commission was more important than all others: the issuance of all federal permits or licenses for either private or public power projects.*

Licensing Authority. Operating under the Water Power Act of 1920, the Federal Power Commission began to develop a public policy for the use of water resources. As licenses were issued for hydroelectric projects, the commission studied the relation of each proposed project to all future uses of the waterway—to river navigation, flood control, and further electricity production.† The maximum term of licenses was fifty years. A preference was stated in the act for municipal and state licenses, though the public projects were expected to meet the requirements of the commission for water conservation, financial ability to carry out construction work, and the right to engage in business.[5] After a license expired the federal government could take over the project, paying the net investment cost of the licensee and severance damages. And each licensee was required to maintain amortization reserves after the first twenty years of operation, to reimburse the federal government for the administrative costs of the Federal Water Power Act, to pay for the use of government lands and other property, to obey state regulations, and to accept the regulations of the Power Commission in the absence of state controls.

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* Using this power, the Federal Power Commission still issues permits and several kinds of licenses. A permit, lasting a maximum of three years, is issued so that a company can prepare plans in connection with a license application. There are three kinds of licenses. A major license is for a project that has more than 100 hp capacity; a minor license is for a project that has less than 100 hp capacity; and a minor-parts license allows the construction of a part of a project such as a reservoir or drainage ditch.

† When the Flood Control Act of 1938 was passed, the Federal Power Commission obtained planning control over all river basins.[4]

The narrow concept of navigable waters, rather than the broader concept of interstate commerce, was used to determine the limits of the federal licensing power. Before the Federal Power Commission was created, the commerce clause of the Constitution was widened by the Supreme Court to include navigation on streams.[6] A strange legal concept of a navigable stream grew out of the judicial reasoning; using this concept, Congress could regulate the use of rivers that did not carry commerce. Although some rivers had shoals or other impediments and insufficient water flows for commercial traffic, they were "legally" navigable.[7] Even if commercial use of a river stopped many years ago, the river still was a navigable stream by legal standards.[8] Navigability is a question not only of natural and historical conditions, but also of possible navigation improvements.[9] When a reasonable improvement can make a river available for transportation, the stream is considered a navigable water of the United States. Even a previous Congressional recommendation for navigation improvements gives a stream the legal quality of navigability. Thus the authority of the Power Commission over inland water resources is broad.

Authority does not end with these fictional limits of river navigation. Recognizing some federal interests in the headwaters and the tributary streams, Congress makes a separate provision for commission authority over "nonnavigable" streams where interstate commerce is affected.[10] In this connection the Federal Power Commission takes the view that, even if its interests in nonnavigable waters are "minor" relative to its interests elsewhere,[11] it can control construction of hydroelectric projects on the nonnavigable streams. Even though a dam on a nonnavigable tributary stream has only a small effect on main-stream navigation, the Power Commission still can exercise the licensing authority. Asserting this "minor interest" doctrine, the commission required a company to obtain a license before a dam was built on the nonnavigable New River in Virginia. The "minor interest" argument of the commission was rejected by a federal district court, but the Supreme Court upheld the commission in 1940. In the New River case the Supreme Court said,

> In our view, it cannot properly be said that the constitutional power of the United States over its waters is limited to control for navigation. . . . In

> truth the authority of the United States is the regulation of commerce on its waters. Navigability . . . is but a part of the whole. Flood protection, watershed development, recovery of the cost of improvements through utilization of power are likewise parts of commerce control.[12]

Even though the state commissions and utility companies protested against an inclusive federal authority over water-power developments,[13] the Federal Power Commission was granted licensing control of nearly all hydroelectric projects.

Breakdown of the 1920 Act. Long before a revision was effected, the weaknesses of the 1920 act were widely recognized. The Power Commission had a basic organizational weakness: an independent commission was not created in 1920. Three cabinet officers—the Secretaries of War, Agriculture, and the Interior—did not make an effective commission. These cabinet members, who were devoted naturally to the main duties in their separate departments, treated their membership on the Federal Power Commission as an incidental part of their political lives. They gave water-power problems only occasional, hurried attention. Nor did they possess any particular ability to regulate the use of water-power resources. The Executive Secretary of the commission was compelled to do most of the work, and to struggle with the water-power interests, who believed they knew more about interpretation of the law than he did.[14]

The Revisions of 1930 and 1935. In 1930 the chief organizational weakness of the Federal Power Commission was corrected. Although no changes were made in water-power regulation, the old commission of cabinet secretaries was eliminated. A commission of five full-time members, serving five-year terms, was established. A regular staff of employees was built up, though the commission still could call on the Departments of War, Interior, and Agriculture for some assistance.

When the Securities and Exchange Commission obtained control of gas and electric holding companies in 1935, the Federal Power Commission also received authority to regulate rates, earnings, financial transactions, and accounting practices of electric companies that operated in interstate commerce. The Federal Power Commission became a public utility regulator as well as the controller of water resources. Before 1935 the interstate movement of electricity increased; technical changes reduced the costs of transmission, and superpower systems of interconnected companies were organized. In 1933 slightly more than 18 per cent of the total electricity output was transported in interstate commerce.[15] These interstate movements of electricity were, for the most part, beyond the control of state commissions. Even though Congress did not undertake regulation of interstate electric sales, the Supreme Court did not approve state control of the sales. When the Attleboro case was decided in 1927, the Rhode Island Commission was denied authority to regulate the price of electricity sent out of the state.[16]

The new legislation,[17] which affects about half of the electric industry,[18] gives the Power Commission authority to fix reasonable and nondiscriminatory rates for interstate sales of electricity. The commission does not control the whole rate structure of an electric company that operates in interstate commerce. Price discrimination between localities can be regulated. And the rate control of wholesale service supplements state regulation: when an intrastate company buys electricity from either an affiliated or an independent company in another state, the Power Commission controls the wholesale charges of the interstate firm and has an indirect effect on consumer prices.

Like other commissions, the Power Commission can require reports, fix depreciation rates for property, and prescribe systems of accounts. It controls the unifications of interstate electric companies. When a company desires to merge, consolidate, lease, or exchange property having a value of more than $50,000, it must have the approval of the commission. No electric company, furthermore, can issue securities or assume liabilities unless they are for a "lawful object" or are "reasonably necessary" to company operations. But control of the issuances of securities or assumption of liabilities does ". . . not extend to a public utility organized and operating in a state under the laws of which its security issues are regulated by a State Commission."

During an emergency the Power Commission is authorized to order temporary interconnections of generating stations and transmission lines. These temporary interconnections can be ordered when, as in a war, one company or region has a shortage of electricity, while the plant capacity of an adjacent company or region is not fully utilized. If a firm is not otherwise subject to the authority of the Power Commission, it is not committed permanently to its jurisdiction because a temporary interconnection is constructed. The commission also has authority to order permanent interconnections. When state commissions or companies apply for them and when the Power Commission finds them "appropriate in the public interest," the permanent interconnections are ordered. But a company cannot be compelled to make an interconnection that necessitates an enlargement of generating facilities, or that impairs the service of its own customers.

The Power Commission also can plan the integration of generating and transmission facilities throughout the electric industry. It is authorized to divide the country into regions so that an "abundant supply of electric energy" is assured and the "greatest possible economy" is achieved in the use and conservation of natural resources. Each region ". . . shall embrace an area which . . . can economically be served by such interconnected and coordinated electric facilities." Apparently the Power Commission is expected to choose what an economist calls an "optimum business unit," an operating area where diversification of sales, reduction of unused plant capacity, and use of the most efficient generating plants afford the lowest possible prices for electricity.[19] But the commission can do no more than study and propose integration plans; it cannot order the organization of regional systems.

NATURAL GAS

As late as 1929 the transmission of natural gas was largely an intrastate business. Then seamless steel pipe and other innovations in pipeline construction appeared. And the economic limit of natural gas transmission expanded from 200 miles or less, the limit for old gas-producing areas, to 1,000 miles or more. At the same time some of the largest gas fields of the nation—the Panhandle field of Texas, the Hugoton field of Kansas, and miscellaneous fields in Texas, Louisiana, West Virginia, and eastern Kentucky—were located in sparsely settled areas and were far from the metropolitan markets for natural gas. High-pressure lines were built from these fields to St. Louis, Chicago, the Twin Cities, Atlanta, Detroit and many other cities of the Middle West and South.[20] After the new, long-distance lines were built, more than half of the public utility sales of natural gas moved in interstate commerce.[21] The transmission of natural gas passed beyond the ordinary bounds of state commission regulation; and public authorities had to choose between no regulation, limited state regulation, or federal regulation.

Even when the state commissions wanted to exercise some control over interstate gas companies and when federal regulation was not in force, the Supreme Court usually did not allow state regulation. Starting with the West decision in 1911, the Supreme Court denied control of interstate gas transportation to state commissions; state regulation was forbidden even though Congress did not provide for federal regulation.[22] In the Barrett case, where exclusive federal control of interstate gas transportation was stated again, the Supreme Court said,

> The paramount interest is not local but national,—admitting of and requiring uniformity of regulation. Such uniformity, even though it be the uniformity of governmental nonaction, may be highly necessary to preserve equality of opportunity and treatment among the various communities and states concerned.[23]

In several cases the Supreme Court approved state regulation of interstate gas companies. When a single company produced the gas in Pennsylvania and sold it directly to utility consumers in New York, the Supreme Court, deciding the Pennsylvania Gas case of 1920, upheld the regulations of the New York Commission.[24] And, as an even more important concession, the Court approved state-commission regulation of interstate gas companies that were corporate affiliates and suppliers of intrastate distributing companies. The Kansas Commission, which always wanted to control the interstate transmission companies in the Cities Service system, had a typical case: the Western Distributing Company, an intrastate company, obtained its gas supply from an affiliated interstate company. The Western Distributing Company petitioned the commission for higher prices; but the commission refused to grant the increases, because it could not determine the reasonableness of the wholesale price of the interstate firm. Upholding the Kansas Commission, the Supreme Court said,

> It is enough to say that in view of the relations of the parties, and the power implicit therein arbitrarily to fix and maintain costs . . . , the state authority is entitled to a fair showing of the reasonableness of such costs, although this may involve a presentation of evidence which would not be required in the case of parties dealing at arm's length and in the general and open market, subject to the usual safeguards of bargaining and competition.[25]

The distinction between arm's-length bargaining and affiliated-company transactions was repeated in other Supreme Court decisions. Two years after the Western Distributing case was decided, the Supreme Court allowed another state commission to inquire into the cost of gas that an interstate transmission company sold to an affiliated intrastate company.[26] And in 1937, when the Illinois Commission wanted to see the cost records of an interstate firm before it fixed the prices of an Illinois company, the Supreme Court upheld the demand for cost evidence.[27] Yet the state commissions had only limited control of interstate transportation of natural gas. They had indirect regulation of some interstate commerce; they could control transactions between affiliated interstate and intrastate companies. But they had no control of the arm's-length business that was a significant part of the rapidly expanding interstate commerce in natural gas. Nor did they regulate the entrance, location, accounting, service policies, and other practices of transmission companies. Even after the Western Distributing case was decided, the consumers of natural gas needed federal regulation.

Federal Control of Natural Gas. After Congress rejected several earlier bills for natural gas regulation, the Federal Power Commission was authorized in 1938 to control the interstate transmission of natural gas.[28] The Power Commission can control only the interstate transportation and sale of gas for "ultimate public consumption for domestic, commercial, industrial, or any other use." And it can regulate the exportation and importation of natural gas between this country and other countries. But jurisdiction over local gas distribution or gas production, the common areas of state-commission authority, is withheld from the Power Commission.

Statutory controls of rates are expressed in the customary language of rate regulation. The commission can fix "just and reasonable" rates, eliminate "undue" preferences, and maintain reasonable differences in rates, service, and facilities between localities and classes of wholesale customers. It can ascertain the "actual legitimate cost of property," fix and examine the accounting systems, and prescribe the measurement of depreciation charges. Companies must give the commission a thirty-day notice of rate changes. When an investigation is pending, the commission can suspend these proposed rate increases for five months. If the new rates go into effect before the commission completes its investigation, the company can be required to post a bond; and if the new rates are found to be unreasonable, the company must refund the overcharges to consumers.

At first the gas companies were required to obtain certificates of convenience and necessity only when they built lines into areas that already were served by other firms. The Power Commission was not authorized to control construction and extension of lines into unserved areas. To correct this deficiency, Congress amended the act in 1942; the companies were required to obtain certificates for all interstate construction, extensions, or acquisitions of natural gas lines.[29] A firm can be ordered, moreover, to extend its lines and to sell gas to a person, company, or municipality that distributes gas to local consumers. But this control of extensions is modified so much that little more than short, nominal extensions can be ordered. A required extension cannot place an "undue burden" on the company, and can be ordered only when it does not "impair" the company's "ability to render adequate service to its customers." * Most of the gas transmission firms voluntarily make extensions of this sort. Finally, as a third control of output, a company must obtain the permission of the commission before a line is abandoned.

The Power Commission's regulation of natural gas firms is less complete than its control of electric companies. Interconnection of gas lines cannot be ordered even under emergency conditions. And the commis-

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* The Power Commission can deny an extension that impairs the service to established customers. In 1946, for instance, the commission did not allow a pipe-line company to sell gas to the Ford Motor Company, because the company did not have sufficient ". . . capacity to sell a large quantity of gas to a new customer without impairing . . . service to existing customers."[30]

sion is not directed to study and propose unification plans for natural gas facilities. Another omission is more important: the commission is not authorized to regulate the issuance of securities, mergers, consolidations, purchases of property, payments of dividends, and other financial matters. Some financial transactions of natural gas companies can be controlled, to be sure, by the Securities and Exchange Commission. Many transmission lines were financed by corporate interests that were engaged already in either production or distribution of gas; they were financed by private rather than public sales of securities. Yet as Congress looked over the financial histories of electric and gas firms, it surely could see why immediate regulation of security issues, combinations, and dividends was desirable in the natural gas industry. They could see the excessive dividend payments, security sales, burdensome debts, and overcapitalization that were results of too much faith in private financial management.

Division of State-Federal Authority. The Natural Gas Act did not fix the specific limits of interstate and intrastate commerce. But the Supreme Court previously marked out a rough line between these legal categories of commerce. When the Landon case was decided in 1918, the Court said that interstate commerce ended when gas passed into "local" mains.[31] This judgment was more precisely stated in the East Ohio Gas case, a case about taxation instead of utility regulation. Justice Butler said,

> . . . when the gas passes from the distribution lines into the supply mains, it necessarily is relieved of nearly all the pressure put upon it at the stations of the producing companies, its volume thereby is expanded to many times what it was while in the high pressure interstate transmission lines, and it is divided into the many relatively tiny streams that enter the small service lines connecting such mains with the pipes on the consumers' premises.[32]

In the East Ohio Gas case the Supreme Court did not specify the amount of pressure that determined the change from interstate to intrastate commerce.* The customary gas pressures of local distributing systems seem to determine where the interstate commerce ends and intrastate commerce begins. But a precise, technical measurement of the limit of interstate commerce is not an important fact now in the regulation of the Power Commission. Except for occasional jurisdictional conflicts, the Power Commission can regulate the wholesale rates of the long and obviously interstate lines, while the state commissions regulate the retail gas rates.

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* In a later case the Supreme Court retained the same gas-pressure distinction between intrastate and interstate commerce.[33] This case, which was decided in 1942, repeated another point: intrastate commerce in natural gas did not begin as soon as the gas crossed a state border, even though a wholly intrastate company carried the gas from the border.

RADIO BROADCASTING

Control of radio broadcasting is exercised exclusively by the federal government; jurisdictional conflicts with state commissions do not disturb the federal regulation. Designed mainly to eliminate program interferences between stations, the control of radio service requires the uniformity of federal action. Unlike other utility companies, broadcasting companies are not subjected to earnings and price controls. Radio service, largely a private service in this country, is sold to advertisers at the best prices that the broadcasting stations and networks can get. As radio regulation is practiced now, the main problem is the allocation of broadcasting licenses so that interferences between stations are minimized.

Before 1927 the radio industry was regulated by the Secretary of Commerce. His authority over the industry was based on legislation that was enacted in 1910 and 1912 to regulate radio communication for ships. Licenses were issued quite freely before 1925; broadcasting rights were granted to manufacturers, appliance dealers, retailers, insurance companies, many newspapers that were already aware evidently of radio stations as rival sources of news, radio enthusiasts, men who had little knowledge of radio techniques but saw good chances for ground-floor positions in a growing industry. By the end of 1923, only three years after the first station began regular operations, the country had almost six hundred stations, though the abandonments exceeded the number of new licenses.[34] Yet the Secretary of Commerce did not have explicit authority to issue broadcasting licenses; he could do no more than act as though he had this authority. Following the action of a Chicago broadcaster, stations began to "jump" their licenses in 1926; they chose whatever broadcasting frequencies and powers they wanted, and created a chaotic condition.[35] To eliminate the interferences between stations, Congress was forced to enact new legislation.

The Federal Radio Commission was created in 1927, and was given control of broadcasting for a single year. Two years later it was made a permanent commission. In 1934 the control of broadcasting, as well as the regulation of interstate telephone and telegraph business, was placed under a new commission, the Federal Communications Commission. This commission was given about the same authority over broadcasting that the Radio Commission had. None of the powers of the Communications Commission is so important as the issuance of radio licenses. A license cannot be issued for a longer period than three years. The commission has authority to assign a wave length and a broadcasting power to each station, to fix the kind of service and broadcasting time of each station, to prescribe the kind of apparatus that a licensee can use, and to set up controls of radio interference. Thus the total number of stations can be restricted, and licenses can be allocated according to clear channel (for night use), regional, and local broadcasting. The main regulatory problem, then, is a technical one: distribution of the limited broadcasting locations and broadcasting time.

Other legislation concerns the geographic distribution of broadcasting service. Listeners in many sparsely settled areas receive poor program service.[36] On the other hand, listeners in the densely settled areas, particularly in metropolitan areas, can choose between several stations and programs throughout the day. Trying to correct the unequal distribution of radio service, Congress passed the Davis Amendment in 1928. The Communications Commission was ordered to make an equal or nearly equal allocation of station facilities to five national zones. And each state within a zone was supposed to have broadcasting service that was proportional to its population. This limitation of the licensing authority obviously was difficult to administer; station owners could not be compelled to operate where the earnings were unattractive, where the prospective advertising revenue was small, and radio talent was scarce. Consequently the Davis Amendment was repealed in 1936. Then the Communications Commission was directed to provide simply a "fair, efficient, and equitable distribution of radio service" between the states and communities.

The public policy of broadcasting control is temperate, has faith in private management, and tolerates a large amount of advertising. First, the radio spectrum is viewed as a public domain. Control of broadcasting is a right of the federal government, a right that is exercised in the interest of public welfare. Next, radio service in the United States, unlike broadcasting in all other large countries, is largely a private business. Third, to avoid broadcasting interferences, the commission licenses only a limited number of stations; more than nine hundred standard stations are in operation, and frequency modulation and television stations are becoming more numerous every year. The Communications Commission does not follow a common practice of public utility regulation: it does not give a station exclusive control of radio service in a locality.[37] Yet no more than a small number of broadcasters are located in any city or urban area; if there is any competition between radio stations, it is bound to be imperfect. Finally, the Communications Commission does not censor radio programs.[38] Congress prohibits the use of profane or indecent language, and does not allow the operation of lotteries over stations. But it does not authorize general control of programs and advertising; it does not provide the regulations that many listeners want to apply to soap operas, abbreviated or warped news reports, repetitious programs, and commercial advertising.

TELEPHONE AND TELEGRAPH

Between 1910 and 1934 the Interstate Commerce Commission controlled the interstate business of telegraph and telephone companies. When the Mann-Elkins Act was passed in 1910, this commission was given authority to control the maximum and the minimum rates, discriminatory pricing, service policies, and accounting practices of interstate telephone and telegraph firms. Regulation of security issues was added in 1920. These were modest controls for a mature telegraph industry and an expanding telephone business. The telegraph industry matured before 1920. And when the Interstate Commerce Commission controlled telephone companies, the Bell system built a large network of interstate toll lines. The long-lines business of the Bell system grew rapidly after 1915, the year when the first transcontinental telephone line was put in operation. Yet, even though the Interstate Commerce Commission had control of interstate telephone and telegraph service for twenty-four years, it undertook only fourteen formal rate investigations: eight for telegraph rates, four for telephone rates, and two for cable rates.[39]

The New Federal Legislation. In 1934 the Federal Communications Commission, which has seven members who serve seven-year terms, was established to control the interstate telephone and telegraph business. Telephone and telegraph companies must charge just and reasonable rates, and they must not use discriminatory prices or preferential classifications of service. These companies must give the Communications Commission a thirty-day notice of proposed rate changes; then the commission can suspend the proposed changes for three months; and if the rates go into effect before the commission's investigation is finished, the companies are obligated to pay refunds to consumers when the commission's choice of rates is lower than the company rates. The commission has authority, of course, to initiate investigations and to make property valuations. Each company can be required to maintain a property inventory according to either an original-cost or a reproduction-cost valuation of the property. And reports, accounting systems, and methods of depreciation accounting can be prescribed.

Before a telephone or telegraph company can undertake the construction, extension, or acquisition of a line, it must obtain a certificate of convenience and necessity from the Communications Commission. Except for strictly intrastate lines or short (less than ten miles) local and terminal lines, the commission controls the expansion of communication companies. It can require the construction of lines also. If the commission thinks that a request for telephone service is "necessary and desirable in the public interest," the company is ordered to build the line. In this connection a company can be ordered to establish physical connections with other systems. Enforcing this provision, the commission can require AT&T, which dominates the long-line business even more than its subsidiaries dominate the local telephone business, to provide toll-line connections for independent telephone companies. Another provision of the act gives the commission general control of extensions. When the performance of service is not likely to be impaired, a company can be ordered ". . . to provide itself with adequate facilities for the expeditious and efficient performance of its service . . . and to extend its line or to establish a public office. . . ."

The Communications Commission can investigate the prices that telephone firms pay for equipment, supplies, research work, and managerial or construction services. This provision is aimed at transactions between affiliated Bell companies. Like other holding companies, AT&T provides engineering, accounting, and legal services for subsidiary systems. When the charges for management services are fixed, AT&T can plan on revenue that covers its own administrative costs and some costs of research work in the Bell Telephone Laboratories. Because the Bell companies count these management charges among the reasonable costs of telephone service, the subscribers to telephone service pay some costs that are really expenses of the holding company rather than the operating companies.* Bell companies have "inside" transactions, too, with the Western Electric Company, the subsidiary of AT&T which manufactures 90 per cent of the telephone equipment of the country.[41] AT&T not only dominates the local and interstate telephone business, but also controls the manufacture of telephonic equipment. Being the owner of Western Electric, it controls the equipment prices on which Bell companies expect returns. Obeying the requirement to investigate the affiliated-company transactions, the Communications Commission undertook an extensive examination of Bell system relationships. But Congress is not yet willing to legislate against the management contracts of the system, or the prices of Western Electric equipment.

Although the Communications Commission has extensive controls of telephone service and telephone rates, it does not have authority to regulate the dividend payments, reorganizations, and security issues of telephone companies. But the commission can prohibit interlocking directorates; no person can be an officer or director of more than one firm that is under the jurisdiction of the commission. And a company cannot carry out a consolidation, merger, or security purchase with another telephone system unless it obtains the approval of the commission.

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* Before 1925 the annual charge for these management services was 4½ per cent of a subsidiary's gross revenue. Part of this charge was a rental on telephone instruments. After the telephone instruments were sold to the subsidiaries in 1929, the fee was reduced to 1½ per cent of a company's gross revenue.[40]

THE CASE AGAINST HOLDING COMPANIES

Federal regulation of gas and electric holding companies, which started under the Securities and Exchange Commission in 1935, was a significant change. Many financiers, formerly free of public control or capable of getting around the weak state commissions, were brought under strict regulation. And federal authority advanced another step; public utility controls became more centralized. To see the main reasons for this regulatory change, we need to examine the behavior of the holding companies—particularly the acquisitive practices during the booming twenties. Before the First World War the holding companies in the gas and electric industries had such modest beginnings and respectable purposes that no one thought of public control for them. Some manufacturers of electrical equipment organized holding companies because they exchanged machinery for the securities of young, struggling enterprises. After it acquired securities in this manner, the General Electric Company, for instance, organized the Electric Bond and Share Company in 1905. Other holding companies were organized by engineering firms that took securities in exchange for their services. When the electric industry was new, holding companies held the securities primarily because they wanted interest and dividend payments rather than managerial authority.

Later the financiers began to use holding companies as means to economic power and fortunes. After 1920 holding companies frequently were organized and managed to dominate and exploit the operating companies—to serve financial rather than consumer ends. Then the reasons for federal regulation began to accumulate. As they promoted the growth of electric and gas systems during the twenties, holding companies were responsible for much manipulation and reckless or fraudulent management. These companies often acquired properties and firms wherever they could buy them, charged exorbitant management fees to operating systems, drained off operating company earnings, distorted accounting records to get more dividends, inflated the capitalizations of companies and the book values of properties, pyramided corporate structures so that small investments controlled much operating property, and sold securities with fictional values to foolish investors. They exploited the ineffectiveness of state commissions and the ignorance of investors. Samuel Insull, the Scotch immigrant whose operating companies provided gas and electric service in the Chicago area, Henry Doherty of the Cities Service system, Wilbur Foshay, and H. C. Hopson of Associated Gas and

Electric were some of the persons who guided and debased holding-company finance.

Consolidation. If holding companies were used properly, they facilitated large-scale production of utility services; they unified companies so that operating economies and lower rates were realized. These economies were achieved by some types of holding-company systems: the companies (frequently subholding companies rather than top holding firms) with interconnected and compact properties, or the large-city type of holding companies such as Detroit Edison. Other corporate systems (e.g., the Columbia Gas and Electric system or the Lone Star system) gave consumers greater continuity of natural gas service than the small, isolated gas companies. Acquiring large reserve acreages of gas land and integrating the use of production and transmission equipment, a system of affiliated natural gas companies reduced the service interruptions and prevented cessations of service. And where the charters of operating companies prohibited property transfers or where, more commonly, minority security holders held out against mergers or consolidations, the holding-company device was the only way to achieve unification economies.[42]

Yet holding companies were not always organized to economize the production of utility services. Toward the end of the twenties many holding companies controlled widely scattered companies. They were not planned as integrated, connected systems. Promoters of holding companies were not concerned primarily with economic optimums for their systems; they were interested in the economic power of property masses that afforded opportunities, even with jerry-built systems and scattered properties, to manipulate, bargain, and profit. Sometimes, as in the case of the Foshay system, the subsidiary companies were scattered because the top companies were little more than brokers of utility securities who bought and sold the control of systems. Holding companies scrambled to buy systems; they bought small companies and municipal plants wherever they found them.* And they tried to rationalize their patch-quilt distributions of properties, saying that such scatterations provided geographic diversifications of investments.[43]

Managerial Services. Service companies were important adjuncts of holding-company organizations. In the gas and electric industries, as in the Bell system, these management or service companies provided engineering, legal, financial, accounting, and advertising services for subsidiary systems. And they provided profits for the holding companies.

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* Nor did they confine themselves to utility companies. Some of them controlled oil companies; others, like the Insull system, undertook real estate developments; and Foshay once had a bank and shoe company in a holding-company system.

The charges for these services customarily were computed as percentages of operating company revenues; a charge of 4 per cent of gross revenue was common during the twenties. Later, when public criticism of the charges became strong, some of the holding companies shifted to their own "cost" measurements of the management fees.

Small operating companies needed some of these special services. But when the service charges were computed as percentages of gross revenues, the large operating companies paid high charges even if they did not need all the services. Some large subsidiary companies could operate efficiently without holding-company assistance; yet they still paid percentages of their gross revenues for unnecessary or imaginary services.[44] Measured as percentages of management expenditures, the profits from management services often were as high as 100 or more per cent.[45] Some holding or management companies received large returns, too, when they supervised the construction of operating properties; these fees were added to the investment costs of properties, and were part of the property values on which the companies asked for returns. These profits from management services were well illustrated in the Standard Gas and Electric system; between 1919 and 1929 the service company collected $36,990,000 from the operating companies, and had a net profit of more than $17,000,000.[46] And not only did these charges increase the costs of utility services, but also the managerial services, such as legal aids, were used to hamper the regulatory work of state commissions. The companies counted the service charges among their total costs of utility services—among the costs the buyers were expected to pay; consumers paid for some services that prevented price reductions.

Several Financial Practices. Holding-company officials argued that their organizations reduced the borrowing costs of operating companies. According to their argument, the security issues of several small companies were combined to make a larger and more easily marketed issue. Large operating companies did not need this service. This was just another way for holding companies to take toll from efficient operating systems. Before these companies were subjected to federal regulation, some of them collected fees, ranging from ½ to 2 per cent of the selling prices of securities, to "find" bankers who were willing to sell security issues.[47] And the holding companies were not always sources of funds for operating companies. Some of them, like the Insull holding companies which owed $90,000,000 to banks in 1932,[48] were weaker financially than their operating companies. Indeed, the thinness of holding-company finance sometimes resulted in "upstream" loans; the operating companies made loans to the holding companies instead of the other way around.

The managers of holding companies tried to protect their narrow margins of voting control over subsidiary companies. Some of these companies had managerial control of operating companies, even though they held only 20 per cent or less of the voting stocks of the subsidiaries. Small stock holdings frequently were large enough for managerial purposes, because the ownership of other voting shares was scattered. These holding companies did not let their subsidiaries issue more voting stocks. Financing the expansions of their plants, the subsidiary companies often issued nonvoting shares of common stock; some common stockholders had managerial rights, and others were only investors. Sometimes a special issue of voting stock was sold to the holding company. H. L. Doherty and Company, once the ruling company of the Cities Service system, bought a special issue of subsidiary company stock and greatly increased its voting control of the system. Buying a million voting shares for only a million dollars, this company increased its voting control of the Cities Service system from 7 to 35 per cent. Another financial policy was widely used to protect the thin voting control of the master companies: the subsidiaries sold bonds, notes, and nonvoting preferred stocks instead of common stocks. Holding-company finance was partly responsible, consequently, for the heavy interest and preferred dividend obligations of some operating systems.

Pyramiding was an elementary characteristic of most holding companies. The holding company held the voting securities of subsidiary firms; the company sold its own nonvoting securities to the public; and the owners of the holding company kept all or part of its voting securities. Keeping only the voting stocks of the holding company, the financiers controlled the operating systems. For a simple illustration let us suppose that a holding company wanted to control six operating companies. Each operating firm issued $600,000 of 5 per cent bonds, $200,000 of preferred stock which had a 6 per cent rate of dividends, and $200,000 of common stock. This was a total of $3,600,000 in bonds, $1,200,000 in preferred stock, and $1,200,000 in common stock. Suppose that 30 per cent of common stock was enough for managerial control, because the ownership of the remaining stock was widely diffused. If so, the holding company, which owned 30 per cent of the stocks of the operating companies, needed a total capitalization of only $360,000. If the holding company sold to the public $120,000 of 6 per cent bonds, $120,000 of 7 per cent preferred stock, and some common stock, the financiers could hold part of the common stock and could control the operating companies. Holding half or less than half of the common stock issue ($60,000 or less), these financiers controlled $6,000,000 worth of operating properties.

These imaginary financial conditions also can be used to demonstrate the pyramiding of earnings. Let us suppose the aggregate net earnings of the six operating systems to be $400,000 a year. After the interest and dividends are paid on operating-company bonds and preferred stocks, a dividend of slightly more than 12 per cent can be paid on operating-company stocks; after bond interest and preferred dividends are paid out of the 30 per cent of operating-company dividends that go to the holding company, a dividend of nearly 24 per cent can be paid on the common stocks of the holding company. Borrowing from bondholders and preferred stockholders at rates of interest that are lower than the rate of earnings, the financiers can magnify their own dividends.

The pyramiding in the gas and electric industries was not always a simple two-layer arrangement of companies; holding-company financiers often built up several layers of companies. Some systems had five or six layers of subsidiary firms between the top holding company and lowest operating company. Making very small investments in the top holding companies, some men acquired control of many large operating systems. Hopson and Mange, the former bosses of the Associated Gas and Electric system, made an original investment of $300,000 and eventually controlled companies that had a book value of a billion dollars.[49] Neither Hopson nor Mange nor other financiers like them were held back by thoughts about adverse financial conditions—about decreases in the earnings of operating companies that could reduce their dividends, compel the holding companies to pass preferred dividends and interest payments, and force the holding companies into receiverships. Since the stakes were high, they were willing to risk the decreases in operating-system earnings.

The total capitalizations of many companies—the total amounts of their outstanding securities—also were inflated in connection with property and security acquisitions. Competing with each other for acquisitions, the financiers often paid exorbitant prices for properties and securities. Municipalities and small companies sold their obsolete plants for excessive prices. Operating companies were sold to holding companies, and the controlling securities of small holding companies were sold to larger holding companies as long as investors were willing to buy holding-company securities. This reckless trading in utility properties and securities did not end until the stock market collapsed in 1929.

Company managers often wrote up the book values of assets, and credited the additions to capital surplus. Some of the write-ups occurred in connection with property or security exchanges between affiliated companies. Many other write-ups were made in property values, even though the properties were not sold. To make the write-ups seem more authoritative, engineering firms were hired to make appraisals of operating properties. Some appraisals were thorough engineering studies of property values; others were superficial, "horseback" studies. Sometimes the medium of an engineering firm was not used; the accountants of the company simply were directed to write up the book values of certain property items. Or when a court or commission fixed a fair property value for earnings regulation, some companies used the regulatory valuation as an authoritative basis for a write-up. Some companies wrote up the book values of their assets as much as 50 to 100 per cent; at one time the write-ups of holding and operating companies in the gas and electric industries exceeded $2,000,000,000.[50]

Dividends, Bonuses, and Salaries. Some dividend payments from operating firms to holding companies were proper. But when holding companies were forced to maintain excessive capitalizations, they were not satisfied with moderate dividends. They often drained the earnings of operating companies as fast as the earnings appeared. And they managed the operating companies so that unearned dividends were paid. Dividends were paid out of the unearned surpluses that came from the asset write-ups. Some operating companies even pared down depreciation charges so that their dividend payments to holding companies could be larger.[51] The owners of holding companies often voted themselves extraordinary salaries and bonuses out of the earnings that they took away from operating systems. From his odds and ends of companies W. B. Foshay received $575,000 in bonuses and salaries in four years.[52] And to assuage Foshay's thwarted boyhood desire for art training, a Foshay company constructed an office building as a replica of the Washington Monument, and furnished the building with statuary and other fineries.

FEDERAL REGULATION OF HOLDING COMPANIES

Starting an investigation of utility holding companies in 1928, the Federal Trade Commission soon discovered and publicized many facts about holding-company finance. This inquiry described the policies of holding companies; the collapse of holding companies during the thirties showed the effects of the policies. The holders of worthless securities demanded regulation of holding companies. And the state commissions admitted that federal regulation was the only satisfactory solution of the holding-company "problem." Utility-company executives, lobbying vigorously, spent at least $150,000 to stop the bill.[53] Passing in the Senate by only one vote, the Wheeler-Rayburn bill became a law in 1935. A straightforward attempt to deal with electric and gas holding companies, the Public Utility Act of 1935 was the most stringent and inclusive piece of regulatory legislation that ever was enacted against American business. Having much power, the Securities and Exchange Commission became one of the nation's important regulators of public utilities.

Corporate Simplifications. A holding company, defined as a company that holds 10 per cent or more of the voting securities of a gas or electric company, must be limited after January 1, 1938, ". . . to a single integrated public-utility system, and to such other businesses as are reasonably incidental, or economically necessary . . . to the operation of such integrated public-utility system." This is the core of Section 11, the so-called "death" clause that requires reorganization or even elimination of many holding companies. Geographic scatteration of holding-company properties is prohibited. But a holding company can retain control of more than one system if (1) all properties are in one state or contiguous states, (2) substantial operating economies are lost by a segregation of properties, and (3) effective regulation or efficient operation of companies is not disturbed. A company can be ordered, moreover, to reorganize its capital structure and to redistribute the voting rights of its securities. The Securities and Exchange Commission can deny an acquisition of property or securities that does not ". . . serve the public interest by tending towards the economical and efficient development of an integrated public-utility system." Acquisitions can be denied, too, if they tend toward interlocking relations, concentrate the control of operating companies, or complicate the financial structures of the involved companies. And the SEC has authority to fix the "fair purchase price" for an acquisition of securities or property.

Financial Controls. Holding companies and their subsidiaries are subject to extensive controls of financial transactions. A security issue must be necessary to efficient operations, and must be adapted to the capital structure and earnings of the company. When securities are issued and sold, the fees and terms of sale must be reasonable. A company can issue securities to finance its business, to refund outstanding securities, or to carry out a reorganization or receivership. Common stock can be issued only when it has a par value and does not give preferences over other stock for dividends or voting rights. Only secured bonds can be issued. And if the SEC wants to exercise more financial controls, it can prescribe rules for dividend payments, solicitation of proxies, and sales of property or securities.

Other Controls. Management contracts between affiliated companies are subject to SEC control. Holding or management companies cannot obtain profits from these contracts; costs of managerial services determine the prices of the services; and the total costs of the managerial services must be allocated fairly among the subsidiary companies. The SEC can prescribe accounting systems and accounting practices for both management companies and holding companies. Officers and directors of holding companies must report their security holdings each month, managerial use of "inside" information is limited, and no officer or director of a bank, trust company, or investment bank can be an officer or director of an electric or gas holding company. The political activity of holding companies is curbed. Political contributions are prohibited. And unless their activities are approved by the SEC, holding-company employees or representatives cannot lobby for a holding company or discuss holding-company problems with congressmen, the SEC, or the Federal Power Commission.

SEVERAL GENERAL CHARACTERISTICS

As late as 1933 federal regulation was confined to the conservation of water resources and the distribution of radio broadcasting licenses. Then the control of telephone and telegraph companies, gas and electric holding companies, and the interstate business of electric and natural gas companies started. Between 1933 and 1938 the federal government became an important regulator of utility companies. A new era in public utility regulation began.

Independence of the Commissions. When federal regulation of the electric and broadcasting industries started before 1930, it was handled by cabinet officers. The Secretaries of War, Agriculture, and the Interior were members of the first Power Commission. And before 1927 the Secretary of Commerce issued broadcasting licenses. Then commission control was substituted for departmental regulation of utility companies; the new federal commissions were not organized as subdivisions of government departments. They, like the Interstate Commerce Commission and most state commissions, are independent commissions; only the courts can review their decisions. And legislative and administrative control of them comes indirectly and slowly through appropriations, statutory revisions, and appointments of members.

Students of governmental processes have criticized the "irresponsibility" of federal utility commissions, just as they have objected to the independence of state commissions.[54] The President's Committee on Administrative Management, observing a general incohesiveness in the growing mass of federal administrative work, wanted to put utility commissions, along with other independent agencies, under government departments.[55] Wanting "over-all management," this committee did not approve of the "headless" character of commission regulation. There is a lack of "over-all management"; federal utility commissions do not function as integral parts of administrative government. But this committee does not demonstrate that the effectiveness of utility regulation can be improved by placing it in a government department. Cabinet officers usually do not have much knowledge of public utility regulation, and they do not have much time for public utility control after they handle the regular work of their departments. And since cabinet officers change at least as often as presidents are replaced, there is certain to be an insecure administrative foundation. The idea of "responsible" utility regulation does not have any apparently necessary relation, moreover, to the common social purposes of utility regulation. Proponents of the idea seem to be focusing their attention on the form rather than the substance of public administration.

Relation to State Commissions. After they experienced some losses of authority over utility companies, state commissions became apprehensive of federal regulation. These losses were confined primarily to railway regulation. When the Shreveport case was decided in 1914, the Supreme Court concluded that Texas railway regulation was burdensome to interstate commerce. Since state regulation interfered with interstate railway transportation, the Court approved federal regulation of intrastate freight rates.[56] In a later case, the Wisconsin Passenger Fares case of 1922, the primary importance of interstate railway commerce was asserted more firmly by the Supreme Court.[57] When passenger fares within Wisconsin were lower than interstate charges, the Court decided that they interfered with interstate commerce. Although the Supreme Court did not approve federal regulation of intrastate railway rates in the North Carolina and Alabama decisions of 1945,[58] the "Shreveport principle" still is a threat to state commissions. Fearing a possible expansion of the principle until all state regulation is subordinated to federal regulation, state commissions covet their controls of electric, gas, and telephone companies.

Trying to allay the alarm of state commissions concerning federal usurpation of their authority, Congress authorizes federal aids to state regulators and wants cooperation between federal and state commissions.* The Federal Power Commission can regulate only "those matters which are not subject to regulation by the states." And the Power Commission can hold joint hearings or conferences with state commissions. Questions can be referred, moreover, to joint state boards; the state members of joint boards are chosen by the Power Commission from a list that the governors or the state commissions submit. And the Power Commission is allowed to assemble information for state commissions, or to lend employees to them.[60] The Communications Commission has approximately the same rights to cooperate with state commissions, and the same obligations to respect their jurisdictions. But the relationship of the SEC and state commissions is subject to only a few statutory conditions.

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* For many years the Interstate Commerce Commission has invited state commissions to join the hearings on common problems.[59]

Although the SEC can duplicate some financial regulation by state commissions, it is not supposed to "affect" the jurisdiction of "any other commission." State Commissions can be admitted to case hearings before the SEC, but no statutory provision is made for joint-state boards or state-commission use of SEC employees.

The federal commissions usually have tried to cooperate with state commissions, and to respect the jurisdiction of state regulators.[61] From time to time the Federal Power Commission has supplied information to state commissions. In several cases, particularly those concerning the wholesale rates of natural gas companies, the staffs of the Federal Power Commission and various state commissions have made joint investigations, or state commissioners have participated in case hearings before the Power Commission.[62] The Federal Power Commission even has helped several state commissions as they have presented cases to the Supreme Court.[63] Some state commissions and the Federal Communications Commission have worked together on several nation-wide investigations of telephone rates. When state investigations have lapped over into interstate telephone business, a few state commissions have asked the Communications Commission for assistance.[64] The division of Bell companies' costs between long-distance and local service and the relationship of interstate and intrastate toll rates have been common problems of state and federal regulators. A committee of state regulators and the FCC have investigated the license contracts between Bell companies and AT&T, and have shown the need for state or federal regulation of the license fees.[65] The SEC, too, has been respectful of state-commission authority; it has admitted state regulators to its hearings, has held joint hearings with several state commissions, and has improved the opportunities for state-regulation as holding companies have been regulated and integrated.[66]

State commissioners are mindful of the cooperative attitude of federal commissions. And when they face difficult regulatory problems, they seem to appreciate assistance from the federal commissions. Yet they still are apprehensive about the growth of federal utility regulation. Federal commissions have a greater jurisdictional scope, more funds for investigations, and more expert members and staffs than the state regulators. The proficiency of federal commissions alarms the state commissions. Perhaps a Georgia commissioner expresses a common view of his fellow regulators when he says, ". . . I admit I am somewhat suspicious of the Federal Communications Commission."[67] And other state commissioners are suspicious of the Federal Power Commission which is an aggressive and able regulator. Anticipating future conflicts with the Power Commission, the National Association of Railroad and Utilities Commissioners passed a resolution in 1943 that asked Congress for a restatement of the commission's authority.[68]

Two recent decisions of the Supreme Court are favorable to federal regulation. In one case, the Illinois Natural Gas case which the Supreme Court decided in 1942, the Illinois Commission was not allowed to order an extension of a gas transmission line.[69] The entire plant of the company was located in Illinois, but the Illinois property was part of an interstate transmission system. Seeing the service extension as an interstate problem, the Supreme Court said,

> . . . the proposed extension . . . is so intimately associated with the commerce [the transportation of gas], and would so affect its volume moving into the state and distribution among the states as to be within the Congressional power to regulate those matters which materially affect interstate commerce, as well as the commerce itself.[70]

When the Jersey Central Power case was decided in 1943, the Supreme Court took an even broader view of interstate commerce.[71] Although the company was operating almost exclusively in intrastate commerce, the Power Commission was allowed to regulate the sale of securities. This firm sold a small part of its electricity, largely as an interconnection service, to a New York company. All the property of the company was located within New Jersey borders; another firm transmitted the electricity to the New York company. Yet the incidental nature of the interstate business meant nothing to the majority of the Court. They read the statutory powers of the Federal Power Commission and found a basis for federal regulation.* Following the majority opinion, the Power Commission could assert its full authority when a company had only a trifling amount of interstate business—even when the Power Commission duplicated the regulation of a state commission.

When a similar case, the Connecticut Light & Power case, was decided in 1945, the Supreme Court was not so willing to broaden the limits of the authority of the Power Commission.[72] In this case the Court considered the incidental nature of the interstate business, and refused to allow federal accounting control for a company that was engaged predominantly in local operations. The Connecticut Company had no property outside the state, and it bought only a small amount of electricity from an outside company. As the majority of the Court (Justices Black, Murphy, and Reed dissented from the opinion) interpreted the intent of Congress, the Power Commission was supposed to regulate the interstate electric sales and was not granted control of local business. Writing the majority opinion, Justice Jackson distinguished between the technical and legal character of interstate and intrastate commerce. Even if the production of electricity was "so fused and interdependent" that interstate commerce could not be separated technically from other business, the existence of state lines and state governments called for a legal distinction. Justice Jackson said,

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* There were three dissenters—Chief Justice Stone and Justices Roberts and Frankfurter. Examining the statute and its legislative history, they reached the conclusion that Congress did not intend federal regulation under the conditions of the Jersey Central case.

> . . . state lines and boundaries cut across and subdivide what scientifically or economically viewed may be a single enterprise. Congress is acutely aware of the existence and vitality of these state governments. It sometimes is moved to respect state rights and local institutions even when some degree of efficiency of a federal plan is thereby sacrificed.[78]

Members, Staffs, and Funds. Federal commissioners are paid higher salaries than most state regulators. No federal commissioner is paid less than $10,000 a year. A federal commissioner often is experienced in regulatory problems before he becomes a member of the commission; he may be a former employee of the commission, a former state regulator, or a student of regulatory problems. And the tenure of federal commissioners promises to be long—perhaps as long as the service of some members of the Interstate Commerce Commission. But there are exceptions. Between 1935 and 1940 the membership of the SEC changed frequently. During this time President Roosevelt used the SEC as a sort of pool for his administrative men, appointing them to the commission when they were idle and withdrawing them when more suitable jobs developed elsewhere.

Receiving regular and special appropriations from Congress, the federal commissions have large and expert staffs that do much intensive regulatory work. With these appropriations the federal commissions can afford frequent investigations and careful prosecution of regulation. Unlike many state commissions, they have enough funds to achieve their objectives. Their regular appropriations are large enough, indeed, to cover the costs of much legal and economic analysis of public utility problems. The Power Commission can spend freely to audit the accounts and to fix the original costs of all electric properties under its jurisdiction; the Communications Commission can undertake special investigations of broadcasting. And Congress provides funds, too, for extraordinary investigations. During the thirties the Power Commission made detailed studies of electric rates throughout the country, and the Communications Commission studied the practices of the AT&T system.

A Centralization of Regulatory Authority. Starting vigorously during the great depression of the thirties that released some restraints of the old liberalism, federal regulation of utility companies is the fresh, dynamic, and most competent regulation of today. Control of interstate telephone business, which the Interstate Commerce Commission did not exploit, passed to a new commission; an expanding technology of electric and natural gas operations, taking more and more business across state lines, was met with federal authority; and the corporate structures of gas and electric holding companies as well as the financial transactions of their subsidiaries, long neglected by most state commissions, came under federal supervision. There are some sharp contrasts between the new federal control and the old state regulation: federal commissions have substantial funds for their work, are sources of new ideas for financial and earnings control, and do not hesitate to hire skilled employees, while the state commissions commonly lack funds, usually are satisfied with old modes and purposes of control, and show a resistance to social knowledge and expertness that is characteristic of so many rural Americans. Federal regulation is certain to overshadow state control as the FCC, SEC, and FPC use their present powers, are authorized in the future to deal with other problems, and stand up to large and clever corporations as only a few state commissions ever do. Federal control represents a new political stage in American utility regulation; it is a product of a renascent, modernized liberalism that recognizes the persisting deficiencies of a democratic social order, but does not bow to a private, monopolistic solution of public-interest problems.

Chapter 6

Accounting Control

BEFORE 1930 many state commissions did not carefully control the accounting for assets, liabilities, expenses, and revenues of utility companies. Extensive managerial discretion in accounting matters was just another characteristic of the "freedom" era in public utility regulation, the time when legislatures and commissions put much trust in the wisdom and integrity of management. Taking advantage of their freedom, some companies adapted the principles of accountancy to their own ends. The managers of these operating companies, who usually were controlled by the aggressive and acquisitive financiers of holding companies, did not follow the conservative rules used by public accountants and other companies. Some book values of property were arbitrarily written up; in some cases the book values were increased even though the properties were not sold, and in other situations the book values were inflated because "inside" exchanges of properties were arranged between affiliated companies by the holding-company financiers. The book values of property frequently were not well classified; they were not properly subdivided into separate property accounts. Accounting for plant depreciation commonly was incomplete and irregular, and in many instances was controlled by the financial managers. And operating expenses often were not segregated clearly from plant investments.

All firms did not distort their accounting records before 1930. Yet, even if their motives were all right, many company accountants and managers were careless in accounting matters. They often failed to classify property values so that they could be allocated to separate property accounts; depreciation accounting was neglected; and some commission rules for accounting were loosely interpreted. Even some state commissions were careless too, because they did not investigate and supervise the accounting practices or failed to achieve a standardization of property and expense accounting. Seeing the distortions of some companies, the indifference of other companies, and the general lack of uniform accounting, commissions finally assumed more control of utility companies. That change, like many other regulatory changes, occurred during the depression years of the thirties. There was a revision in accounting systems, requiring a new kind of accounting for property values, periodic accounting for plant depreciation, a reclassification of expense and revenue accounts, and other significant changes. Accounting control became what it should have been at least twenty-five years beforehand; it became a means of controlling utility companies in the interest of consumers and has been an important instrument of effective regulation, an indispensable source of the factual information needed by commissions for respectable regulatory achievements.

OBJECTIVES OF ACCOUNTING REGULATION

Recording transactions and classifying property values, expenses, and revenues, accountants can provide useful factual information for earnings, output, and financial controls. The principles of accountancy are developed, to be sure, for private companies. But the private origin of much accounting thought does not prevent an easy adaptation of the reasoning to regulatory ends. Like the accountants, the regulators give attention to individual companies and are interested in an accurate and literate record of the transactions of each company. There is no difference between the basic views of accountants and regulators, unless some accountants put service to their utility company masters ahead of their respect for their professional principles.

Accounting principles and accounting systems provide means rather than purposes of general regulation. Sometimes this distinction is overlooked. Having principles that they hold quite firmly, accountants often exalt their rules and make them the standards of public policy. The accounting principles become the principles of public regulation, though they should be treated as procedures by which certain regulatory results are achieved. At any rate, the accounting regulations seem to be more appropriate for procedural matters. If accounting procedures are carefully prescribed, the commissions have access to revenue, cost, and property valuation facts that can be used for earnings, price, and financial regulation. An improvement of procedures and records can improve the effectiveness of commission regulation, but accounting mechanics alone is not enough for wise, extensive, integrated controls of utility firms. As the Wisconsin Commission says, regulatory functioning cannot ". . . be reduced to a mere mechanical process by which the correct answer to any question can be found almost automatically by reference to books of account."[1]

One purpose of accounting regulation is the prevention of falsification or distortion of financial records. When the public utility managers had a great deal of accounting freedom, some of them twisted accounting records to their own private ends.[2] Remembering these experiences, commissions now carefully prescribe the classification of expenditures; they differentiate between capital costs and current operating costs, and separate the expenses that are chargeable to buyers from the expenses incurred for managerial and investor interests. Maintaining a distinction between capital costs and current costs of operations, the commissions do not allow companies to charge large investments in durable plant to operating expense accounts.[3] If investment expenditures are charged to operating expense accounts rather than to fixed-asset accounts, the consumers eventually provide the firm with a debt-free plant on which the investors still claim a return. Similarly, the consumers must be protected against the payments of expenses, such as those incurred for public-relations activities, that are clearly beneficial to the companies' investors. Expenditures for "institutional" advertising, for instance, usually can be treated as investor costs instead of service costs. Likewise, some executive salaries or even the costs of maintaining luxuriant offices are not necessary costs of public utility services.

Accounting control is most useful in earnings regulation. Since commissions are expected to restrict utility companies to reasonable earnings, they want extensive and accurate statements of the costs of service. Basing their reasonable earnings measurements largely on costs, the commissions first want records of operating expenses—the costs of labor, materials, rents, taxes, advertising, and numerous other current costs. Another kind of cost is depreciation expense, the cost of using property that eventually wears out or becomes obsolete. And another distinctive cost is the investors' return—the return on the property that the company uses to perform public utility service. Indeed, determination of the depreciation cost and the investor return, which is discussed extensively in later chapters, is the crux of earnings regulation in this country.

When the depreciation cost and investor return are determined, commissions can use the regulated book values of property. If a common accounting definition of depreciation, the consumption of an investment value for any reason, is accepted, then the measurement of depreciation cost is based on the amount that is invested in public utility property. Using this measure, the regulators can readily compute depreciation cost when the book values of property are recorded at the actual investment costs of the property. Not only the annual depreciation cost but also the reasonable return for investors can be based on the book value of property; the reasonable annual return can be determined by multiplying a reasonable rate of return by the property value. Utility companies, wanting to protect their earnings or to get more earnings, commonly prefer a return that is based on the reproduction cost of useful property; but commissions, behaving opportunistically in the direction of lower prices, usually prefer a return that is based on the original cost or investment cost of property. Although the Supreme Court once required consideration of both reproduction-cost and original-cost valuations of property as the reasonable returns were computed, it recently began to favor original-cost valuations. At any rate, the Court approved commission orders where the investor returns were based exclusively on original-cost valuations of property.

Accounting data also are useful for financial regulation. They can be used to control the changes in total capitalization, the increases in indebtedness, and the payment of common-stock dividends. Regulation of the total capitalization, which is the total value (usually the par value or original selling prices) of outstanding securities, depends on accounting records of property values. Since the commissions commonly relate the values of outstanding securities to the property values, they want to control the book values of new construction work, purchases of securities or real estate, and property acquisitions in connection with mergers and consolidations. Lacking reliable accounting records of property values, a commission may not provide intelligent regulation of new security issues; the total capitalizations of utility companies can become excessive, and the indebtedness can become so burdensome that reorganizations are necessary. And when commissions control dividend payments to common stockholders and must, perforce, take a long view of utility company finances, they rely on accounting records of revenue and costs. Dividend control calls for careful accounting measures of net income and judicious use of earned surplus. A carefully drawn definition of earned surplus, full provisions for depreciation expense, and denials of common dividend payments when the earned surplus account is low—these are ways to avoid future financial troubles and to protect the equities of senior security holders.

Another possible use of accounting data is connected with price structures. Developing new uses for their services and classifying customers, utility companies do not have simple price structures. Price differentiation, which depends on the use, time, quantity, and various technical conditions of service, is a notable characteristic of the telephone, gas, and electric industries. To control these price differentials and to prevent (or limit) price discrimination, commissions can use cost information. The present accounting records, unfortunately, do not show just what the commissions want to see. Even if they look carefully at the books, they cannot read the costs of service—the total cost of a whole service classification or a new service. Part of the trouble is joint production; the same management, laborers, and plant commonly are used to produce several kinds of service. And another difficulty is the imperfection of cost accounting; cost analyses for utility services often are controlled by rough, expedient rules rather than some refined integration of expenses and production. This is a place for more accounting revisions and special cost studies. Even if they cannot measure the exact costs of each service, commissions can use more knowledge of cost behavior.* At least they can learn more about the relationship between costs and price differentiation.

THE RIGHT TO REGULATE

Long ago most utility companies conceded their loss of a strictly private status and admitted a public utility status. But they did not admit any greater loss of their rights than the combined force of the legislatures, commissions, and courts forced them to admit. For a long time the companies argued that a submission to accounting regulation did not go with the public utility status. Since accounting records usually were considered the most private parts of private enterprises, the companies believed that the records were not subject to public regulation. Choosing a managerial standard of utility regulation, the firms had a good reason for the "privacy" arguments: they knew that earnings and price regulation could become more severe as soon as the commissions prescribed accounting practices, and regulators had reliable factual information about revenue and costs. In some states, such as Wisconsin where accounting control began as soon as regulation started, the companies had no large chance to fix their own accounting rules. Yet they tried to ward off advances in accounting regulation wherever they could. When commissions prescribed uniform accounting systems, the utility firms contended that they had a right to determine the substance of the accounts. Determination of "proper" expenses was, they believed, a managerial function. Gradually they had to grant commission control over more and more accounts and accounting entries, but commissions had to overcome strong resistance to every change.

The Supreme Court did not uphold the claims of the companies that accounting systems and practices were private matters. In 1912 the Goodrich Transit Company, which was engaged largely but not wholly in interstate business on the Great Lakes, challenged the right of the Interstate Commerce Commission to require separate revenue and expense accounts for interstate, intrastate, and noncarrier business. Upholding the commission, the Supreme Court said,

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* The condition of joint production, which is discussed in later chapters, prevents an exact measurement of service costs. Convenient and arbitrary allocations of joint costs can be made, but logical and determinate allocations are impossible. Assigning the joint costs to separate outputs, a company or commission takes the costs out of their context—out of the joint production context. And if this difficulty is not present, then the company or commission is troubled, perhaps, by fixed costs and by manifold variations of production and selling conditions.

> If the Commission is to successfully perform its duties in respect to reasonable rates, undue discriminations, and favoritism, it must be informed as to the business of the carriers by a system of accounting which will not permit the possible concealment of forbidden practices. . . . Further, the requiring of information concerning a business is not regulation of that business.[4]

A year later the Interstate Commerce Commission, in the Kansas City Southern case, required a railroad company to write off the remaining investment in an abandoned railroad line. Although the company said that the commission order prevented the payment of preferred stock dividends and impaired the credit standing of the firm, the Supreme Court again upheld the commission. Speaking for the Court, Justice Pitney said,

> The very object of a system of accounts is to display the pertinent financial operations of the company, and throw light upon its present condition. . . . So far as such uniformity requirements control or tend to control the conduct of the carrier in its capacity as a public servant engaged in interstate commerce, they are within the authority constitutionally conferred by Congress upon the Commission. There is no direct interference with the internal affairs of the corporation; and if such an interference indirectly results, it is only such as is incidental to lawful control of the carrier by the Federal authority. . . .[5]

The Court approved accounting regulations unless they were ". . . so entirely at odds with fundamental principles of correct accounting as intrinsically to manifest an abuse of power." [6] In the Kansas City Southern case the Court found no such abuse of regulatory power.

In 1932, nearly twenty years after its Kansas City Southern decision, the Supreme Court again approved the accounting regulation of a public utility commission. The Norfolk & Western Railway Company bought three mines and produced coal for its own locomotives. When the Interstate Commerce Commission instructed the company to record the investments in these mines as nonrailroad property, the firm protested and appealed to the courts. Supporting the commission for a third time, the Supreme Court concluded that

> The record shows that it is unusual for a railroad to own mines for the production of locomotive fuel; in fact we are referred to no other similar instance. Whether the Commission should make special classifications to fit exceptional cases lies within the discretion conferred, and courts ought not to be called upon to interfere with or correct alleged errors with respect to ac-

counting practice. If we were in disagreement with the Commission as to the wisdom and propriety of the order, we are without power to usurp its discretion and substitute our own.[7]

In the Norfolk case the Supreme Court was willing to approve accounting regulations that were based on more than the conventional accounting principles.[8] The Court, being unwilling to place its own judgment above that of the commission, gave an implied approval, in fact, to practically any kind of accounting regulation.

DEVELOPMENT OF UNIFORM SYSTEMS

Accounting control, like many other means of regulation, developed slowly. For years the legislative and regulatory authorities apparently did not realize the need for uniform accounting systems and standardized accounting procedures. Perhaps many of them did not understand clearly the nature and purposes of earnings and price regulation. Massachusetts regulators could prescribe uniform accounting systems for street railway, gas, and electric companies before 1890—long before other states began to to regulate these kinds of utility companies. In Wisconsin and some other states the accounting regulation began as soon as commission control of "local" utility companies was authorized. Before the First World War when the regulation of public utilities started in many states, the legislatures commonly gave the commissions authority to prescribe accounting systems and accounting practices. Yet in these early years each commission either chose its own system of accounts, or left this as well as management of accounting practices to the companies.

Utility firms developed some of the first uniform accounting systems. The first important standard classification of electric accounts was devised by the National Electric Light Association, an association of private electric companies. Not until 1919 did the National Association of Railroad and Utilities Commissioners start to work on a uniform system for the electric industry. Three years later the National Association presented uniform systems of accounts for gas and electric companies; uniform systems for other utility industries also were developed during the twenties. Most of the state commissions adopted them, even though the systems had significant defects. They gave too much accounting authority to the utility companies. When the first draft of the uniform electric system was drawn up in 1920, representatives of private electric companies did much of the work.[9] And the accounting ideas of private electric systems were evident in the final draft of the uniform system. Managers of utility companies could fix, in part, the book valuation standard for property, and could choose the method of depreciation accounting.

A general revision of accounting control finally came during the thirties. In 1931, 1934, and 1935 the New York and Wisconsin Commissions initiated some notable accounting changes.* The Federal Communications Commission prescribed a new accounting system for telephone companies in 1935, and two years later the National Association of Railroad and Utilities Commissioners approved a similar system for intrastate telephone companies. In 1936 the NARUC and the Federal Power Commission presented systems of accounts for electric firms. And in the same year another system, embodying the form and principles of other uniform systems, was adopted by the NARUC for gas companies. Less than two years after Congress passed the Natural Gas Act in 1938, the Federal Power Commission prescribed a uniform system of accounts for the natural gas companies that operated in interstate commerce. The systems of the federal commissions went into effect at once. But the NARUC systems had to be approved by state commissions before they were effective. Except for occasional modifications, most state commissions adopted either the Power Commission system or the NARUC system for electric companies.[11] By 1944 one or more of the NARUC systems, either in the official or a slightly modified form, were adopted by twenty-three state commissions; twelve state commissions adopted the Power Commission's system completely or with modifications for electric companies; † and nine commissions had their own accounting systems for one or more utility industries.[13]

THE CHARACTERISTICS OF UNIFORM ACCOUNTING

Commissioners determine the general public policy of accounting regulation, but the methodology of accounting control now shows the influence of expert accountants. Being in the hands of experts, the details of accounting regulation are numerous and are easily understood only by the accountants themselves. A simple list of the balance sheet, plant, income, operating revenue, operating expense, and clearing accounts is long; each account is accompanied, too, by a description of its use; and there are many significant general definitions and instructions. These details are essential to effective regulation. But they are scarcely interesting or even useful to students who do not examine regulation through the methodology of accounting. The economist or general student of regulatory problems is interested in the general nature of utility company accounting; he wants to know the relation of accounting controls to the regulation of earnings, prices, and financial matters. A few of these general characteristics, which are largely products of the accounting revisions after 1930, are examined in the remainder of the chapter.

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* Morehouse traced the origins of the general accounting revisions to a 1931 order of the Wisconsin Commission. This order prescribed a partial revision of the accounts of electric companies.[10]

† The Securities and Exchange Commission prescribes accounting systems for operating companies that are under its jurisdiction, and are not regulated by any other commission. Electric companies are ordered to use the Power Commission system, and the NARUC system is prescribed for gas companies.[12]

Original Cost of Property. Before accounting revisions were effected during the thirties, the state commissions prescribed a cost valuation of utility properties for accounting purposes. When the NARUC systems were drawn up in the early twenties, the cost of property was defined as the amount of money (or its equivalent) that was actually paid for property. Yet the accounting for property values often was not well done. The rules of property valuation were not well adapted to the numerous mergers, consolidations, and acquisitions that were negotiated during the twenties.[14] And many commissions were poor regulators of accounting practices; they did not even make the companies conform to the established rules. Neglecting their records, some electric and gas firms accumulated large amounts of unclassified plant; as much as 50 per cent of the investments of some companies were carried in a single account, the account titled "fixed capital not classified by prescribed accounts."[15] These unclassified costs became common because companies made lump-sum purchases of properties, did not have property inventories and appraisals with which the lump sums could be apportioned to separate plant accounts, and were not required by commissions to minimize the unclassified costs. Even if the company managers did not mean to distort their records, the property accounts often were in bad shape. Under these conditions the accountants and commissions often could not verify the costs of property retirements; nor could they obtain reliable cost valuations of the properties of some companies. Wanting uniformity of property accounting and more intelligible records of property values, the commissions were compelled to revise the regulations.

A widespread carelessness in property accounting, which some commissions seemed to condone, was bad enough. But it was not the most provoking practice in property accounting. The worst evils were arbitrary write-ups of property values and property exchanges between affiliated companies at inflated prices. These write-ups and "inside" property exchanges were parts of holding-company finance, parts of the reckless expansion and questionable business conduct of public utility promoters. Sometimes a plant was exchanged several times, or was included in several successive consolidations. And as each exchange or consolidation was effected, the plant was recorded at higher and higher book values. Some affiliated companies exchanged properties, indeed, because they wanted to write up their property values. When holding companies or their management companies added fees to the acquisition prices of properties, further write-ups occurred. Some write-ups were imaginary "overhead" expenses of construction work. And another kind of book value revision was common too: managers made an "inside" revaluation of property and credited the increment to the capital surplus account. Other companies wrote up book values to the reproduction costs of their properties; or they wrote up property accounts to whatever figures suited their financial purposes.

Irregular and careless book valuations of property provoked regulatory action. Seeing abundant evidence of arbitrary book valuations and wishing to achieve uniformity in property accounting, commissions imposed a conservative accounting standard of property valuation on the utility companies.[16] All the revised systems contained the new standard: property items in the plant accounts were recorded at their original costs. This was the ". . . original cost incurred by the person who first devoted the property to utility service."[17] This was a special but practical or workable definition of the original cost of property. It was not based on conventional accounting thought, because accountants generally valued assets at the costs to the existing companies. Commissions did not wish to record all the present investment costs in the plant accounts. But the commissioners and their accountants did wish to classify the investment costs; the "first" original cost of utility property was recorded in the plant accounts, and the remainder of the present investment cost was put in adjustment accounts. The investment cost of a company's plant was segregated, but the record of the investment cost was not destroyed. Using the first original costs of utility plants, the commissions were able to standardize the accounting for property values.

The original-cost rule is applicable to all operating companies regardless of their holding-company affiliations, financial practices, or accounting histories. There are no exceptions to the rule. Even if a plant is purchased at a sensible price from an unaffiliated company, the plant accounts still are supposed to contain only the original cost to the original utility owner. Legitimacy of the transaction does not have any bearing on the classification of the investment cost, though it does influence the disposition of the excess above the "first" cost. Nor does the age of the plant affect the accounting record. No matter how old the equipment is, the commission still goes back to the cost when public utility use of the property started—to the cost of the first utility company. And if the records of a company do not reveal the original cost of property, the commission estimates it. But a separate cost measurement is not always made for every property item; average costs are used for like units of property such as telephone poles that are installed in the same year and have a similar location.[18]

The plant accounts of the systems are adapted to the original-cost requirement. The original cost of property items is recorded in the main plant account and in detailed plant accounts. Other accounts contain the excesses that represent property acquisitions at more than the original cost, capitalized fees of affiliated management companies, overhead expenses for which the company cannot show evidence of payments, excessive construction costs, and arbitrary write-ups of property values. Although all the uniform systems have the same original-cost requirement, they do not have the same plant account titles and the same segregations of book values. The Federal Power Commission's system of accounts for electric companies, which is widely publicized because the commission is an aggressive regulator, contains the following plant accounts:[19]

100.0	Electric Plant
100.1	Electric Plant in Service
100.2	Electric Plant Leased to Others
100.3	Construction Work in Progress
100.4	Electric Plant Held for Future Use
100.5	Electric Plant Acquisition Adjustments
100.6	Electric Plant in Process of Reclassification
107.0	Electric Plant Adjustments

The most significant accounts are 100.1, 100.5, and 107. Only the original cost of serviceable property is recorded in account 100.1. If a company builds its own plant, the total cost of construction (exclusive of any improper costs) is recorded in the Plant in Service account and its many subaccounts. The original-cost rule does not affect all book values of property; it does not require a restatement for the large amounts of property that the present companies have built themselves. The special adjustment accounts, accounts 100.5 and 107, are used primarily in connection with property acquisitions, write-ups, and intra-system transactions. Any difference between the original cost and the book value of all property is recorded in accounts 100.5 and 107. These two accounts contain different kinds of excesses above original cost. The Power Commission's system of accounts states simply that account 100.5 shall contain the difference between the original cost and the company's cost (less the depreciation reserve) of property acquisitions. In practice, however, a more pointed distinction is made: account 100.5 contains the "legitimate" excesses above original cost that are incurred, for example, in straightforward, open purchases of property. It contains the excesses that can be amortized as costs of service. On the other hand, account 107 contains the write-ups and other improper book values that were recorded prior to the accounting revisions. It contains the improper excesses that are chargeable to the investors rather than the consumers.

A Conflict. Utility-company managers and investors strongly object, of course, to the original-cost standard of book valuation. Wanting an opprobrious term, these men call the standard the "aboriginal" cost standard. They do not wish to give up important managerial powers, the accounting valuations of assets, and the classifications of property values. Nor do they like the financial effects that they anticipate from some of the new property accounting. After they build up total capitalizations and capital structures that are related to their own book values of property, they do not want to go through asset revaluations that may disturb the relationships. Even if the book values contain arbitrary write-ups, some companies still do not wish to yield to asset revaluations. The "innocent investor" argument is used too: a revaluation injures the stockholders who know nothing about the write-ups, financial manipulations, affiliated company transactions, and imprudent investments. As a further point, the companies realize that the "first" costs rather than the old book values can be used to measure reasonable returns and reasonable depreciation costs. Indeed, as a consequence of the accounting revisions, they do experience price and earnings reductions, because some commissions base earnings measurements on the first original costs rather than the higher investment or reproduction costs of properties.

Utility company objections to the original-cost standard are backed up, in part, by some accountants. While the accountants of commissions naturally support the original-cost rule, some public and academic accountants desire a different standard of book valuation.[20] They prefer a more conventional standard of property accounting: actual cost to the existing company. If a firm, negotiating in an arm's-length manner, buys some property, the exchange price is the proper book valuation of the acquisition. These accountants do not go behind an open transaction, asking how much the preceding owners paid for the exchanged property. This is a private standard of property valuation. And the same standard is applied to both utility and nonutility companies: the plant accounts of any privately managed and privately financed firm should contain a record of the actual cost of property. No distinction is made for the companies whose accounts, finances, prices, and earnings are subjected to intensive public regulation. Preferring private valuations of property, some accountants criticize the special regulatory definition of first original cost, the segregation of property values into account 100.5, and amortization of some actual property costs. A few accountants go further: even when property is exchanged by affiliated firms, they say that a higher commercial value can be recognized and that the actual legitimate cost of property can increase.[21]

Seeking an elimination of arbitrary write-ups and a general reclassification of book values, the regulators did not choose an actual-cost or prudent-investment standard of book valuation of property. They desired a more practical, more useful standard. Either the actual-cost standard of accountants or the prudent-investment standard afforded a way to eliminate the write-ups, and to standardize the accounting for property values. Yet these valuations, which were more familiar than the first original cost in 1935, had a significant defect for practical accounting control: a distinction was made, particularly in the prudent-investment method, between proper and improper increments in property values. Choosing a prudent-investment standard, commissioners could anticipate protracted investigations, and much litigation about when property exchanges were arm's-length transactions, what price should be fixed for property exchanges between affiliated companies, and what management fees and overhead costs were proper costs of plant. To minimize the difficulties of accounting regulation, the commissions chose a special definition of book cost that went behind all property exchanges and that kept all property value increments out of plant accounts. Measurement of the right property values and disposition of excessive book values still were problems, but their solutions were deferred. The regulatory definition of original cost—the cost of property when it was first devoted to public utility service—was a convenient choice. Even if this definition was not common before 1935 and was an administrative convenience, it did provide a basis for reliable property inventories, a segregation of tangible and intangible property values, and standardized data for earnings and financial regulation.[22]

The Legal View of Revaluations. The Bell companies objected to the original-cost rule, and appealed to the courts for relief. But the Supreme Court did not support the companies. Justice Cardozo, who wrote the Court's opinion in the American Telephone and Telegraph case of 1936, observed that the ". . . price agreed upon between them [the affiliated interests] may be a poor criterion of value," and that property sometimes is purchased for its "nuisance value only." [23] The Court did not approve the elimination of any excessive book valuation. Justice Cardozo said, ". . . only such amount will be written off as appears . . . to be a fictitious or paper increment." [24] Speaking of a "fictitious or paper increment," the Court apparently thought of a book value that was created by an arbitrary write-up or an inside property exchange, not by an open and intelligent exchange for more than the original cost of property. In any case the Court was satisfied to follow the accounting judgment of the commission—even an "unwise and burdensome" judgment; only the "expression of a whim" was the basis for judicial interference with administrative action.* Following previous decisions, the Court allowed the commission much discretionary control of accounting practices.

Revisions and Adjustments. Most of the state commissions apparently ordered utility companies to adjust their plant accounts to original-cost figures; they trusted the companies to make the correct computations of the original-property costs. That was all most state commissions, which lacked funds for detailed audits, could do. Left to companies, the revaluations were done slowly; and some of them were put off until after the war. But a few state commissions, such as the New York Commission[26] and the Federal Power Commission, undertook close examinations of company accounts. Having more funds for regulatory work than any state commission, the Federal Power Commission investigated the original property costs of all electric companies under its jurisdiction. The investigations of the Power Commission covered about $9,000,000,000 worth of property—about three-quarters of the electric plant of the country.[27] These investigations revealed that some companies claimed higher costs than the commission found, were inclined to treat the excesses above original cost as legitimate excesses, and even tried to escape the requirement by alleging a loss of accounting records.[28]

Since some of the excessive property valuations are results of arm's-length transactions while others are consequences of write-ups and affiliated company transactions, the dispositions of the excesses are not alike in all cases. Among electric companies, for example, the amounts in account 100.5 are treated differently from the amounts in account 107. When the excesses above original cost of property are segregated, the legitimate or proper excesses, which are products largely of property exchanges between independent companies, are placed in account 100.5. If the procedure of the Power Commission is followed, the amount in account 100.5 is "depreciated, amortized, or otherwise disposed of, as the Commission may approve or direct."[29]

The Power Commission believes that the amounts in account 100.5 are intangible values, and should be eliminated from the accounting records. Although the commission does not wish to "theorize as to the specific type of intangible which this excess represents," it does say that the excess "can principally be explained in terms of potential earning power."[30] Nothing is said about more efficient plants as a result of the past property acquisitions; yet acquisitions may reduce the costs of service even if returns are allowed on the values above the first original costs. And nothing is said about possible discouragement of further economical acquisitions; yet companies may not wish to acquire established plants if they must write off part of the acquisition prices. Reducing plant values to what it considers tangible values,* the Federal Power Commission orders companies to amortize the amounts in account 100.5 as operating expenses over 5-, 10-, or 15-year periods.[31]

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* This view was reaffirmed in another accounting case that was decided in 1946.[25] A Bell company was ordered to charge more than $4,000,000 worth of book value adjustments to surplus; the FCC made the charges directly against the stockholders, because the book value additions grew out of transactions with the parent company and were considered write-ups. Again the Court accepted the accounting judgment of a regulatory commission.

Some state commissions do not follow the Power Commission; they do not charge the values in account 100.5 to operating expenses. They leave the legitimate excesses, growing out of arm's-length transactions, in the account. For instance, the Arkansas Department, which is willing to leave intangible values in the plant accounts,[32] says that the accounting systems are not designed to ". . . destroy evidence of cost incurred as the result of an arm's-length transaction, and do not require . . . arbitrary adjustments of accounts . . . which have the effect of destroying existing valid property rights."[33] And the Montana Commission follows the Arkansas decision, calling it the "outstanding decision on the original. cost system of accounts."[34] The Arkansas and Montana Commissions accept the advice of practicing and academic accountants rather than those of the Power Commission.

Preferring their own accounting standards and insisting on their own regulatory authority, some state commissions are in conflict with the Federal Power Commission.† As the Arkansas and Montana decisions indicate, state commissions do not always require amortization of what can be called the legitimate excesses in the book values of public utility plants. They do not revise the accounting records of all investment decisions: if the investments in property acquisitions are reasonable and are negotiated in an open or arm's-length manner, the excesses in account 100.5 are undisturbed. But the conflict is not confined to accounting

* Prices of utility property, like the prices of the property of unregulated companies, doubtless were based on anticipated earnings—on the prospective revenue and costs. If commission regulation of earnings was weak at the time of a property exchange, the acquisition price represented, in part, a capitalization of excessive earnings. While a capitalization of excessive returns was proper under lax regulation, it became an excessive property valuation as soon as regulation was tightened up.

† Another conflict, starting with the Arkansas and Montana cases, developed between Power Commission accountants and some academic and public accountants. Several prominent accountants testified for the Arkansas and Montana companies, and opposed the principles of property accounting that the Federal Power Commission wished to use. Writing an opinion of the Montana Power case, the commission accused the witnesses (two academic accountants and one public accountant) of unsound accounting principles, conflicting thoughts, failure to answer questions, and selfish motives.[35] Then, in turn, the commission was charged with unwarranted besmirchment, inaccuracies, and distortions of facts and thoughts.[36] The first-cost rule stirred up an unsettled controversy and stimulated thought about public utility accounting.

methods. It covers the division of regulatory authority between the Power Commission and the state commissions; it is a problem of state rights vs. federal authority. A determined and expert regulator, the Power Commission even tries to impose its accounting controls on companies that are operating predominantly within a single state. Such aggressive action alarms the state commissioners who do not want to relinquish their authority, even if they do not have much money for regulatory work. When the Supreme Court decided the Connecticut Light & Power case in 1945, it gave protection to state control of public utility accounting.[37] Since nearly all transactions of the company were within Connecticut and since the Federal Power Act of 1935 was designed for federal control of interstate electric sales, the Power Commission was denied general accounting control of the firm.

Amortizing the 100.5 accounts as charges to operating expenses, commissions obviously increase the accounting costs of service. These write-offs of excess book values seem to fall on the consumers. This is true under certain conditions. When the amortization charges increase the reasonable service costs and lead to price increases or prevent price reductions, these charges are paid by the utility customers. They can be paid, too, by the company investors, particularly if a company has more than reasonable earnings and does not anticipate an immediate earnings investigation. These charges, being additions to the accounting costs of service, reduce the earnings that are available for dividend payments. Reducing the excessive earnings that ineffective regulators do not take away with price reductions, the amortization charges for the 100.5 accounts are investor costs for prospering companies; they represent an indirect regulation of earnings.* Under these conditions the commissions do not give all utility companies a "break" when they allow write-offs of property values to operating expenses.

Charges against Stockholders. While the amounts in account 100.5 are amortized as costs of service and sometimes are paid by the customers, the contents of account 107 are charged directly to the stockholders. The commissions place several kinds of excessive book values in account 107: excessive prices of property transfers between affiliated companies,[38] stock payments (even many years ago) to promoters,[39] affiliated company profits or high engineering fees in connection with construction work,[40] reputed overhead costs for which the firms cannot submit evidence of payments,[41] and write-ups as a result of managerial revaluations of properties. Similarly, if a company reaccounts for property values, the amounts are included in account 107. If a firm charged poles or other equipment, for instance, to operating expenses in past years, the commission does not allow the company to reaccount for the property and to include it in the "Plant in Service" account.

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* In the latter part of Chap. 13 the disposition of these property values is discussed in relation to economical plant acquisitions.

The Power Commission's system of accounts states that the amounts in account 107 "shall be disposed of as the Commission may approve or direct."[42] The Federal Power Commission, assisted sometimes by the Securities and Exchange Commission,[43] directs companies to charge off the amounts in account 107 to either earned or capital surplus. Some state commissions, too, order write-offs to earned or capital surplus.[44] When the excesses are charged to earned surplus, the stockholders pay for them out of accumulated past earnings or future earnings.[45] Sometimes the parent companies contribute securities or cash, and provide capital surplus for the write-offs.[46] If the companies do not have enough earned or contributed surplus for the charge-offs, the Power Commission and other commissions allow companies to write down the book values of their common stocks, create a capital surplus, and write off the excessive book values to the created capital surplus.[47] Because the promoters issued common stocks to themselves before the First World War and arbitrarily wrote up the book value of the stock, one company was treated more severely by the Federal Power Commission.[48] This firm was required to accumulate $3,500,000 worth of earned surplus, and to erase a write-up of the same amount before dividends were paid on common stock. Seeing nothing arbitrary in the action of the commission, the Supreme Court upheld the order.[49] Like the original-cost standard of property valuation, the elimination of write-ups received judicial approval.*

If company managers and some accountants cannot stop the use of the first-cost rule, they want to reduce the charges to earned or capital surplus. Trying to protect the book equities of stockkholders and endeavoring to reduce the size of account 107, they argue the legitimacy of intercompany transactions. While the Federal Power Commission insists that only an arm's-length transaction is a reliable measure of investment cost, the private interests argue that the exchange price between *any* parties can be a reasonable measure of property value.[51] (This defense does not extend to promoter profits, imaginary overhead costs, and arbitrary write-ups of property values.) I can see some truth in what they say. Affiliated companies, like unaffiliated firms, can bargain intelligently and vigorously with each other; some transactions are reasonable.† Buying property or services from an affiliate, a company may pay no more than if it buys from an independent firm. And the acquisitions can provide more economical combinations of property—means of reducing costs and prices. But the Power Commission or any other commission cannot easily discern what transactions are prudent—which firms bargain as though they are financially independent. At least the Power Commission seems to make a practical segregation of property values above the first original cost.

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* The Supreme Court said, "Although . . . the Commission's prescribed method of eliminating the write-up may not accord with the best accounting practice, it is sustained by expert evidence. It is not for us to determine what is the better practice so long as the Commission has not plainly adopted an obviously arbitrary plan."[50]

† When property is acquired from affiliated companies, all commissions do not want to write down the book value to the first original cost. The Montana Commission, for instance, believes that a ". . . transaction between affiliates should be recognized to the extent that it is based on the fair commercial value of the property. . . ."[52]

Retirement Units. Another problem of property-value accounting, a distinction between current expenditures and capital improvements, is handled with a list of retirement units. A property-retirement unit is a kind of property that is recorded in the plant and balance sheet accounts when it is acquired, and is withdrawn from these accounts when it is retired. It is an item of property for which the purchase price is treated as a plant investment rather than an operating expense. Ever since utility firms began to operate, their accountants distinguished between plant investments and operating expenses. Following the general practice of accountants, most utility companies probably treated the regular costs of plant maintenance, small expenditures on special repairs, and small replacements of equipment as operating expenses, but charged the replacement costs of large equipment items to plant accounts. But while some sort of distinction necessarily was maintained between investment costs and current costs of operation, the distinction was not standardized as long as the companies controlled the accounting practices.

Even if the companies distinguished between operating expenses and capital investments, all of them did not make the same distinctions. Allowed to judge what were and what were not investments in utility plants, the companies were certain to reach somewhat different conclusions. A standardized segregation of operating expenses and plant investments depended on commission regulation. To achieve this kind of standardized accounting, commissions prescribed lists of retirement units. A list of retirement units made an arbitrary, but useful, demarcation between investment costs and operating costs. The Federal Power Commission developed two lists of retirement units, one for electric companies and another for natural gas companies; the Federal Communications Commission assembled a list for telephone systems; and the NARUC adopted the federal commissions' lists for telephone and electric companies and developed lists for other utility industries. A retirement list contains many property items whose cost is charged to a plant account at the time of acquisition, and whose cost is charged to depreciation expense during their useful lives. Utility firms must obtain commission approval before they condense the property retirement lists. But the companies can expand them. As the Federal Power Commission says in connection with the natural gas system of accounts, "The list of units may be expanded by any natural gas company without authorization from the Commission. . . ." [53]

Continuing Property Inventories. Some commissions also require continuing or perpetual property records. A continuing property inventory is a record of property items arranged according to the technical characteristics, locations, ages, and costs of properties. Such a property inventory not only is a source of evidence on the original cost of property, but also is used to measure the service life of property, to compute depreciation rates, and to facilitate the earnings and price regulation of commissions. After the Valuation Act was passed in 1913, the Interstate Commerce Commission required railroad companies to maintain records of additions to and retirements of their properties. The New York and Wisconsin Commissions first required continuing property inventories in 1934 and 1935 respectively.[54] In 1937 the Federal Communications Commission ordered the telephone companies under its jurisdiction to maintain property inventories,[55] though the completion date for the inventories was extended into 1946.[56] And by the early forties use of perpetual property inventories was reported in fifteen states; [57] at least a third of the state commissions used these inventories.

Construction of a continuing property inventory begins with the selection of the property units in which the record is to be expressed.* The property units in a continuing inventory should conform to the uniform system of accounts, and the same kinds of property usually should be found in the inventory that also are represented in the list of retirement units. All property items in the inventory are recorded at their original cost, the cost of property when it was first used to produce utility service. A separate original-cost value is listed for many property items. But where a large number of identical items are used, the company can compute an average cost for all the items that are installed in each year. The date of installation and rate of depreciation for each item or group of items is listed. As soon as a property item is retired, it is taken out of the continuing property inventory. Finally, the location of each item or group of items of property is recorded, and maps are used to describe the locations of some items. The Federal Communications Commission, for instance, requires property classifications by plants and accounting areas.[59] Such an accounting area cannot cross state lines; consideration is given to operating districts, city limits, county lines, and taxing districts so that the chosen area is adapted to governmental needs. Likewise, the New York and Wisconsin Commissions require locational classifications of property according to government units, taxing districts, or operating systems of each company.

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* A standard form of continuing property inventories had not yet been developed. A committee of NARUC concluded, indeed, that "in the matter of continuing property records there will probably be a sad lack of uniformity." [58]

Companies complain that the perpetual property inventories are costly and burdensome to investors. The cost of obtaining detailed information about existing property often is quite high. Most of the firms start from scratch; they have neither a complete list of their property items nor a complete record of the ages and costs of the items. Making up for many years of inadequate property accounting, they must spend sizable sums to establish their first continuing inventories of property. Part of the initial cost of an inventory is the expense, too, of an original-cost valuation of property. This cost is not necessarily a burden of the company's investors. If the firm has excessive earnings, the additional cost reduces the dividends of common stockholders. But when the cost of establishing and maintaining a property inventory reduces the earnings of a company below a reasonable level, the firm can ask the commission or courts for higher prices and pass all or part of the inventory cost to consumers. Actually the companies have a more personal reason for their opposition to continuing property inventories: these inventories give the commissions access to more information, and thereby facilitate more investigations and more regulation of prices or financial transactions.

Like the original-cost rule for a property valuation, a continuing property inventory is a tool of regulation. It is a way to compile a complete record of the original cost of property. As a further aid to accounting, such an inventory provides an accurate property classification according to plant accounts. And, having a continuing record of property additions and retirements, commissions and companies can accumulate data about the service lives of different property items and can thus make the depreciation rates more accurate. In other ways these inventories speed up the work of earnings and price regulation. Although the inventory shows original-cost values of property, it can be used to compute other kinds of property values. If the regulatory process requires reproduction-cost valuations of the property of a company, a commission can determine the valuations by multiplying current prices by the property units. The tedious, costly job of engineering appraisals does not delay regulation. And when a regulatory problem arises in one of several communities served by a company, the continuing inventory provides an immediate record of the property that is used to serve the community.*

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* This does not mean that the inventory shows exactly how much property is used to serve each community. Some property, such as an electric generating station or a transmission line, is used to serve several communities. If some equipment produces service jointly for several towns, the inventory does not reveal exactly what part of total depre-

Depreciation Accounting. When accounting systems were revised during the thirties, notable changes were made in depreciation accounting. Before 1930 most utility firms, except Bell Telephone companies, did not make regular annual charges for depreciation expense. Unlike most unregulated corporations, they did not practice full-reserve accounting for depreciation. Instead, they commonly practiced retirement accounting. When utility companies used the extreme form of retirement accounting, they made charges to retirement expense (charges of the whole investment cost of old property) only when property was retired from service. Depreciation-expense charges were not made throughout the useful life of property. A modified form of retirement accounting also was used: a partial reserve, called the retirement reserve, was accumulated during the useful life of property when some charges were made each year to retirement expense. The retirement-expense charges covered a part of the anticipated costs of property retirement. Either form of retirement accounting seemed to be beneficial to the stockholding interests. When earnings were low, the payment of common-stock dividends was not limited by the charges to depreciation expense. And when the earnings were large, the companies had chances to avoid regulatory reductions of prices and earnings because they could make large charges to retirement expense.*

Retirement accounting interfered with the earnings and price regulation of commissions. Although commissions did not object to payments for property use or to the recovery of utility company investments, they were dissatisfied with retirement-expense charges. They did not like the irregular charges that were made only at the times of property retirements. And they did not like the managerial control of the timing of retirement-expense charges. Preferring regular annual charges for property use, they wanted depreciation accounting. They wanted to anticipate the eventual plant retirements, making depreciation charges throughout the estimated service life of depreciating property. Even though the depreciation charge for a year did not measure the plant deterioration and obsolescence of the year, they preferred the regularity of depreciation charges to the irregularity of retirement-expense charges. Retirement accounting, furthermore, could and sometimes did impair a company's capital. Withholding charges for retirement expense, a company could pay larger dividends to the common stockholders. Such a practice used up the investment values of the bond, note, and preferred stockholders. When a firm used retirement accounting to enlarge the common-stock dividends, it ulti-

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ciation cost and reasonable investor return is chargeable to a single community. Yet the inventory shows some of the separable service costs for each community or area.

* Both retirement and depreciation accounting are discussed more extensively in Chap. 15.

mately was forced to reorganize its finances—or revenue from consumers was used to make up the undermaintenance of plant.

A substitution of depreciation accounting for retirement accounting is a part of the later accounting practices. In the present accounting systems the depreciation of property is treated as an annual cost of utility company operations. Depreciation is defined as the ". . . loss in service value not restored by current maintenance [and] incurred in connection with the consumption or prospective retirement of . . . plant in the course of service from causes . . . known to be in current operation and against which the utility is not protected by insurance."[60] Now the utility firms must maintain regular depreciation-expense charges during the estimated service life of each depreciable property item. And wherever the commissions are authorized to control depreciation accounting, they prescribe the way in which the periodic charges to depreciation expense shall be computed. Following the common practice of depreciating accounting, commissions require annual charges to depreciation expense for all depreciable property. The charges are spread (usually in equal annual amounts) over the service life of each property item; the original cost of property, less its salvage value, is written off prior to retirement of the property. And managerial manipulation of depreciation accounting is finished.

Affiliated Company Transactions. When holding companies were strong and expanding, the accounting for affiliated company transactions was not segregated from other transactions. Now the operating companies must follow a special accounting procedure for affiliated company transactions, recording them in special clearing accounts before they are placed in other accounts. These clearing accounts consolidate the accounting record of dealings between affiliates, making it easy for the commissions to survey and to audit the transactions. All uniform accounting systems, including those of the FCC and FPC, have a separate account for management and supervision fees which are paid to holding companies or their subsidiary service companies. And among the balance-sheet accounts of electric companies, for example, are accounts for investments in securities of associated companies, advances to and from associated companies, notes receivable from and payable to associated companies, and accounts payable to and receivable from associated companies. Although the SEC does most of the holding-company regulation today, the other commissions are not missing opportunities to have clear accounting records of the affiliated company transactions.

Expenditure Controls. Before 1930 the accounting for expenditures was not closely restricted. That defect, too, was remedied. The number of expense and revenue accounts was increased, and more detailed instructions for the use of revenue and expense accounts were included in the uniform accounting systems. The charges to operating expense accounts must be "just and reasonable." If they are not, the commissions do not count the charges among the costs of service, and customers are not expected to pay them. When it decided the American Telephone & Telegraph case in 1936, the Supreme Court approved the requirement of "just and reasonable" expenses. Justice Cardozo said, ". . . the need for such a standard has been made manifest for years as the result of intercorporate relations that are matters of common knowledge."[61]

Accounting for the revenue and expenses of appliance sales is a special problem. Utility men usually argue that, because appliance sales promote additional business, the operation of gas- and electric-appliance departments ought to be treated as parts of regular utility operations. Yet some legislatures and commissions classify appliance merchandising as nonutility business. Yielding to the arguments of private appliance dealers, they deny gas and electric companies an opportunity to collect losses on appliance sales from their customers. The present accounting systems also treat the appliance sales as nonutility business. Unlike the earlier systems, the present accounting systems classify the difference between income and expenses on jobbing work and merchandising as "other income" or "other expense." But the uniform systems are not inflexible in this connection. If a state commission does not explicitly designate the status of appliance transactions, a company can treat the gains and losses as operating incomes and operating expenses.

Chapter 7

Regulation of Financing

BEFORE 1930, when moderation was the general tone of regulation and the old liberalism still was accepted as a good tradition, public utility commissions usually did not interfere with the financial decisions of the companies. Managers rather than regulators determined the total amount of capitalization, the kind of securities to be issued, the sale of securities, and the size and frequency of dividend payments. After the stock market collapsed in 1929, the effects of managerial control of financial transactions were revealed. Unsuspecting investors, deluded during the twenties by an apparent holding-company prosperity, suddenly learned that their firms had inflated capitalizations and other financial defects. State commissioners learned, too, that they gave too much financial control to utility-company managers. They knew, too, that the effects of inadequate financial regulation could not be easily erased. Yet these effects could be avoided in the future. Changing their ways in the early thirties, state commissions became more aggressive regulators of financial transactions. And when the Securities and Exchange Commission began to regulate the capitalizations, capital structures, dividends, and other financial matters of holding companies and their operating subsidiaries, an even greater advance in financial regulation was realized.

THE GENERAL PURPOSES OF FINANCIAL CONTROLS

When the regulation of public utilities was new, most commissioners did not believe that the financial policies of utility companies could affect the prices of service. Today many regulators, remembering the unhappy financial experiences of past decades, do not doubt that prices of utility services often are related to the financial condition of the companies. Consumer prices are affected by the total capitalization. Wanting to dominate a larger market, a firm may pay excessive prices for properties or securities. Carried away by the spirit of a boom period, the managers of a utility company may expand too rapidly and acquire an excessive plant capacity. And they may capitalize the unreasonable returns that commissions are supposed to eliminate. Or a promoter can issue securities to himself because he wants more managerial power. Financed in this manner, a company is overcapitalized. If the firm avoids a credit impairment or a receivership, the revenue from consumers must be high enough to support the whole capitalization. The consumers support the unnecessary as well as the necessary capitalization. Plant expansion and more borrowing, on the other hand, can be beneficial to consumers; investments in improved equipment and new markets bring in earnings that are available for rate reductions. Consumers want economical borrowing and prudent investments. When a company makes the most economical investments as output enlargements and innovations are effected, the consumers' interests are served.

The nature of the capital structure is also to be considered. The owners of the voting securities sometimes do not want to sell more voting stocks to the public. Increasing the amount of outstanding voting stocks, they reduce their managerial control of the company. These managerial interests want to sell bonds, notes, and preferred stocks to the public. Then, when the debts and preferred stocks are outstanding and the firm is obligated to pay interest and preferred dividends periodically, the management may be cautious and not take chances with earnings. Disregarding the consumer interest in price reductions and service improvements, such a company is likely to choose conservative price and service policies. The consumers gain something from the issuance of much common stock. A further case is the payment of common-stock dividends. Common stockholders sometimes want to drain off earnings as soon as they are available; at least many of them do not always desire large financial "cushions" against future decreases in earnings. Failing to build up an earnings reserve for future interest and preferred dividend payments, a company increases the chance of a receivership. During a protracted receivership the service can deteriorate, and prices are not reduced. The consumers have a stake in dividend payments.

Financial practices can affect the reasonable earnings that commissions prescribe for utility companies. The conventional method of earnings control consists of more than a valuation of assets. A fair rate of return is selected, and is multiplied by the property valuation to determine the reasonable return. As they choose a rate of return for a company, commissioners can be influenced by the financial condition of the firm. Consider the case of a company having a large capitalization and high ratio of indebtedness to common stock. The regulators can avow, to be sure, that the large amount of capitalization has no significance in earnings control. Yet the company has financial commitments; it must meet its interest obligations and preferred dividend payments, or face receivership. The regulator must make a similar choice; either the commission allows enough earnings to avoid receivership and to permit borrowing, or it does not. If the firm is greatly overcapitalized, the commission may not try to save it from a financial reorganization. But when the company is only moderately overcapitalized and has a fighting chance to avoid receivership, the commission is likely to be indulgent. An ordinary commission often lets the financial condition of utility companies affect the earnings regulation. Even if earnings are based on a property value instead of a capitalization value, the commission chooses a rate of return that is high enough to support the capitalization.

Another purpose of finance regulation is the protection of guileless investors. This is the main reason, in fact, for SEC regulation of utility-company finances. The hapless investor must be protected against the kind of exploitation that he once suffered from holding-company promoters; the equities of bondholders and noteholders receive particular attention. Commissions examine the asset values and prospective earnings, control the responsibilities and selection of mortgage trustees, prescribe sinking funds for debt amortization, and require provisions for plant maintenance and depreciation. Issuance of debt securities and preferred stocks is discouraged. Companies are encouraged or are ordered to increase the financial "cushions" that provide protection for future interest and preferred dividend payments. To build up the cushions, commissions watch or restrict common dividend payments, encourage investments out of earnings, and urge sales of common stocks. Distribution of the voting rights, too, can be controlled; issuance of nonvoting common stocks can be prohibited, and the investments of the voting stockholders can be increased so that the relation between voting rights and investments is less unbalanced. Even a general reorganization may be used to redistribute voting rights, particularly when the voting stockholders have a small investment relative to the total plant investment.

A HERITAGE: THE YEARS BEFORE 1930

When commissions withhold financial regulations for a long time, the regulations are more difficult to enforce in the future. That is a notable difference between financial controls and the regulation of accounting, earnings, prices, and service policies. Accounting changes can be effected quite easily, even though depreciation accounting, book valuations of property, and other accounting matters are controlled by utility companies for many years. Likewise, a commission can quickly change the regulatory treatment of an expenditure such as advertising cost or a management fee. And even if a company is accustomed to excessive earnings, a commission can reduce earnings and prices at any time. But the financial status of a company is a different matter. The capitalization and capital structure of a company are fixed for some time—perhaps forever. Since commissions rarely call in outstanding securities and prescribe new financial arrangements for operating companies, they cannot freely correct the past financial transactions. Some readjustments of capitalization, such as write-downs in the book values of common stocks, can be made; but debt securities commonly are not eliminated unless general financial reorganizations are undertaken.

Statutory Powers. Among the state commissions the Massachusetts Department of Public Utilities has the best record of financial regulation. Although Massachusetts regulation of utility-company finance began before the Civil War, general financial regulation of local utilities started in 1894 when an "anti-stock-watering" statute was passed. The Board of Gas and Electric Light Commissioners had authority to control the issuance of securities, to fix the prices of securities at their market values, to adjust a company's capitalization of outstanding securities to the "fair structural" value of its property, and to deny payments of stock dividends.[1] But the New York and Wisconsin statutes, which were passed after 1900, became the common pattern of state legislation. Based on the New York and Wisconsin patterns, state regulation of utility-company finances was concentrated on the amount and purposes of security issues, and did not fix their prices. Another fact about the New York-Wisconsin pattern of regulation was important: the control of earnings was related to property values instead of security values. As the chairman of the Wisconsin Commission said in these early days of regulation, "Regulation of corporate securities is . . . for the benefit of investors and . . . it has no bearing . . . upon the question of rates."[2] Even Senator La Follette, the aggressive and constructive political force behind the early Wisconsin legislation, said, "The public need not concern itself with all the villanies of overcapitalization."[3]

Twenty-two commissions at least controlled the issuance of securities in 1922. During the next eight years no other commissions obtained control of financial transactions. And most of the twenty-two commissions did not get any new powers. The financial controls of 1930 were essentially those of 1920. Before 1930 the commissions usually had authority to specify the purposes of security issues, to limit short-term loans to one- or two-year terms, to fix the terms of security issues, and to control the proportion of debts to stock issues. But some commissions did not have specific authority to control mergers or combinations, acquisitions of securities or tangible property, and dividend payments.

Commission Shortcomings. Unfortunately most commissions did not make full use of their available statutory powers. Only a few commissions, in fact, were mindful of the importance of security regulation. Unlike other commissions, the Massachusetts Commission used interest and dividend obligations as the measure of reasonable earnings. The California Commission always was active in financial regulation after it was created in 1912; California companies were required, for instance, to equate their total capitalizations to the original costs of their properties. And the Wisconsin Commission did not neglect security regulation during the twenties. But elsewhere financial regulation commonly was done in a perfunctory manner, or it was not done at all. Apparently these commissioners thought that decisions about additional capitalization, the amount of indebtedness, dividend payments, and other financial matters were chiefly the responsibilities of managers. They seemed to accept the view of the companies: regulation of financial transactions constituted an invasion of the managerial domain.[4] Before 1930 both the private firms and commissions gave attention to more investments in utility plants and more utility service, not the control of financial transactions. Financial regulation was sacrificed so that companies could invest easily and could carry on rapidly the expansion and the unification of utility plants.

The liberality of commission regulation was plainly evident in the total capitalizations of utility companies. Before 1930 the companies often were allowed to equate their total capitalizations to the fair values or the reproduction costs of properties rather than the original costs of properties. One commission, explaining this basis for total capitalization, said, ". . . the amount of the securities issued should not materially exceed the value which would be found as a basis for the determination of rates." [5] And the New York Commission, which had more funds to spend on regulatory work than any other commission, frequently allowed a total capitalization as high as the fair values or reproduction costs of properties.[6] State regulators reproached the Supreme Court because it required fair valuations of properties and demanded consideration of reproduction-cost valuations when the reasonable earnings were determined. Yet these commissioners approved the same fair valuations or reproduction-cost valuations as the measures of total capitalizations. Approving generous measures of total capitalization, commissions condoned unnecessary and excessive increases in the outstanding securities; they did not stop the financiers from capitalizing prospective excesses in earnings or from acquiring excessive or inefficient plants. Companies were not held closely to economical investments; they were not required to enlarge or improve the service production as each increase in total capitalization occurred.

Write-ups in the book values of the assets of companies, which were common in holding-company finance, sometimes were accompanied by enlargements of the total capitalizations. Some commissions permitted capitalization of going values and other intangibles; others used the property valuations of holding-company engineers when the total capitalizations were fixed.[7] Before 1930 many new securities were issued to finance the acquisitions of plants and securities, and to carry out mergers and consolidations. But most commissions did not regulate the payments for properties or securities. One commission expressed a common view when it said promoters were privileged to ". . . stake their money on their judgment." [8] Even though it found "no meeting of independent minds," the Missouri Commission still approved an acquisition of property.[9] Other regulators ignored excessive acquisition prices, because they expected benefits from the unifications.[10] A Connecticut commissioner, whose commission never refused a request for a consolidation, expressed his indifference to these increases in capitalization in another way. In an interview he said that a company foolish enough to pay an exorbitant price for property had only itself to blame.[11] And the Nebraska Commission, unable to see prospects of a reasonable return from an acquisition, expressed the same view when it said, "It is a risk the purchasers are taking." [12] Except for occasional decisions,* the state commissions cooperated with financiers who issued securities carelessly, and rushed to merge and consolidate utility firms.

Commission control of capital structures was liberal, too. Being almost completely free of regulatory restrictions, the company managers usually issued bonds, notes, and preferred stocks instead of common stocks. Massachusetts firms were exceptions to the general rule. Controlled by a conservative commission and managed frequently by cautious men, Massachusetts companies built up capital structures in which common stocks were predominant. Elsewhere a bond-stock ratio of two to one was a common characteristic of the capital structures.[14] When the bond issues of a utility firm were about 60 per cent of the total capitalization, most regulators apparently believed that the company had a reasonable amount of indebtedness. Even the California Commission, taking care to equate the total capitalizations to the original costs of properties, permitted bond issues up to 60 per cent of the total capitalizations. Nor did commissions show any anxiety about the amount of the preferred stock issues. Until unpaid preferred dividends began to accumulate during the thirties, commissions commonly did not see any reasons why preferred stock issues should be limited. And state commissions did not restrict the widespread sales of preferred stocks to utility consumers, even though these sales were designed quite as much to discourage buyer requests for rate investigations as to obtain investable funds.

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* Even though the New York Commission allowed total capitalizations that were equated to the fair values instead of the original costs of properties, it did not approve all financial plans. This commission did not approve mergers that were planned by "unnecessary" intermediate holding companies. And it did not condone property acquisitions that were obtained under competitive bidding between rival companies or rival financial interests.[13]

THE BEGINNING OF POSITIVE CONTROL

Public authorities learned the hard way about an indifferent financial regulation. When the depression of the thirties deepened and when utility companies went into receiverships or experienced lesser financial troubles, legislators and commissioners finally recognized the importance of financial regulation. The demand for utility services decreased, or did not increase; utility companies often were hard pressed to meet their financial obligations; and the weaknesses of public utility finance were revealed. Some operating companies had serious financial troubles, and went into the hands of receivers or saw the receivers' shadows. But the operating companies were less severely affected, of course, than the holding companies that depended on the common-stock dividends of operating companies. Many holding-company systems tottered or collapsed; their practices, which ranged from "stripping" operating-company revenue to outright fraud, were revealed to the investors and the public. Startled by these experiences and revelations, legislators gave commissions more authority over financial transactions. At the same time the regulators became more forceful in financial control.

Statutory Changes. Ten state commissions began to control financial practices for the first time. Twenty-four states, led by Wisconsin, enacted legislation to regulate the transactions of affiliated companies. Controlling the dealings of affiliated companies, commissions could require lists of the voting stockholders of operating companies, supervise "upstream" loans, and regulate contracts between the affiliates.[15] Eight commissions received additional statutory authority over new security issues, reorganizations, mergers, and dividends. Changes were scarce, however, in one section of the country. Except for Kansas, the Western agricultural states, the states between the Mississippi River and the Sierra Mountains, did not revise their controls of utility-company finance. And a few other legislatures did not delegate further controls of financial matters. Some commissions had the same controls of financial transactions that the legislatures originally delegated to them many years before.[16]

A federal commission, the Securities and Exchange Commission, is the most important regulator of public utility finance. Its specialty is control of financial transactions, instead of earnings and price control. The SEC has authority to regulate the security issues and other financial transactions of electric and gas holding companies and their subsidiaries.* It can control the selection of new securities, determine the amounts and the kinds of assets that are placed behind bond issues, require the issuance of common stocks with par values, and fix nonpreferential distributions of voting rights. Conventional purposes of security issues are prescribed in the statute: plant expansion, refunding of outstanding bond and note issues, mergers or consolidations, and "necessary or urgent corporate purposes." A security issue must be adapted, moreover, to the earning power and existing capital structure of the company; the sale of securities must be "necessary or appropriate to the economical and efficient operation" of the firm; and the conditions of security sales must not be detrimental to the interest of the public, investors, and consumers. A holding company cannot borrow from its subsidiaries; it cannot negotiate "upstream" loans. Acquisitions and sales of property, including the acquisitions of securities, are subject to commission control. All charges or fees paid by companies in connection with property acquisitions or security flotations must be reasonable. And the SEC can fix rules for dividend payments or solicitations of proxies.

Jurisdictional Conflicts. A conflict can arise between the SEC and state commissions. Such a dispute can arise because the SEC has some jurisdiction over the financial transactions of companies that also are subject to state regulation. Empowered to regulate the financing of the subsidiaries of holding companies, the SEC has authority over both intrastate and interstate operating companies. Some of these operating companies also are under the jurisdiction of state commissions. The Public Utility Act of 1935 restricts SEC regulation of state-controlled companies. When an acquisition of property or securities is expressly authorized by a state commission, the act excludes the acquisition from SEC control. The SEC also can exempt from its control security issues that are expressly approved by state commissions, but it is not compelled to exempt any security issue that a state commission authorizes. It can fix rules and regulations for the exemptions that are considered ". . . appropriate in the public interest or for the protection of investors or consumers. . . ."

The SEC exempts many security issues that are approved by state commissions. These exemptions are given even when the state commissions do not carefully investigate and restrict the issuance of securities, even when the SEC apparently does not like to approve the securities.

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* Although the SEC is the main federal regulator of the finances of gas and electric companies, the Federal Power Commission, too, has control of some financial transactions of electric companies. When the electric companies are engaged in interstate commerce and are not subject to the control of any state commission, the Power Commission regulates acquisitions of securities, property sales and leases, mergers, consolidations, and new issues of securities.

But the SEC does not "rubber-stamp" the decisions of state commissions. Each case is investigated, facts are reviewed, and a separate opinion is given. These separate opinions, some of which are long and full of details, seem to reflect the feeling of superiority of the SEC in security regulation. Occasionally, too, the SEC expresses dissatisfaction with the total capitalization or capital structure of a company, even though it allows the state opinion to stand. In a few cases the SEC goes further (usually after consultation with state regulators[17]), and revises a state-commission decision. In an important case, the Consumers Power case of 1939, the SEC said that state-commission approval of a security issue was a "necessary but not a sufficient" condition for the sale.[18] And in several other cases the SEC revised state-commission authorizations, attaching its own additional restrictions of the security issues.[19] If the SEC continues to revise or even to examine state regulation of financial transactions, it can provoke jurisdictional conflicts.

THE PROBLEM OF TOTAL CAPITALIZATION

The total capitalization of a utility company—the total amount of outstanding securities—is an important problem in security regulation.* If the expansion and unification of companies is uncontrolled and if the selling prices of securities are not regulated, then the capitalization can be larger than it needs to be for economical service production. Capitalization control usually is expressed as a relation of security values to property values; a company is overcapitalized when the value of outstanding securities exceeds the value of property. Several measures of property values and security values are available. The original selling prices, par values, and current book values are possible measures of security values. And property values can be measured either by the original costs of property, the reproduction costs of property, or the discounted values of the prospective earnings. An earnings measure of a property valuation, a common measure among unregulated businesses, can be eliminated because it involves circular reasoning; the state commissions control both the earnings and security issues. And the original-cost and reproduction-cost measures can be eliminated for another reason: arbitrariness. These eliminations leave the commission with no measure at all. Since an immutable measure of the right amount of total capitalization does not seem to be available, regulators choose a somewhat arbitrary measure of total capitalization. Being practical administrators, they commonly choose a simple capitalization formula: an equation of the first original costs or investment costs of property to either the par values or original selling prices of securities.

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* In this chapter the discussion is restricted, for the most part, to financial controls of operating companies or mixed operating-holding companies—to companies engaged directly in the performance of public utility services.

Another view of the proper capitalization can be obtained by looking at the separate increments in the total capitalization of a company. If a firm borrows and invests wisely, the total capitalization is minimized. If company managers choose the best ways to expand operations and if they sell securities intelligently, they manage reasonable increases in the total capitalizations. Financing a service expansion or a technical innovation in this manner, a company economizes the investment costs of service; it minimizes the total capitalization changes relative to service improvements. Such a sale of securities is a reasonable increment in the total capitalization, because no better alternative is apparent. This measure of a reasonable total capitalization makes allowances for mistaken investment decisions—for fallible human judgments of future economic conditions. Perhaps, as a result of technical innovations or demand changes, some borrowing and investing turns out badly. But if the proper total capitalization is measured hindsightedly, the borrowing and investing decisions are taken out of their real contexts. According to a moving, practical view, the right total capitalization, therefore, is represented by a time series of security sales and investments, each of which is managed intelligently as it is made.

Measures of Total Capitalization.[20] Commissions do not accept either the fair value or the reproduction cost of property as a measure of a reasonable total capitalization.[21] The California Commission, which equated the total capitalization to original cost of property during the years when other commissions allowed companies to use a fair value or a reproduction-cost measure,[22] said, "An estimate of what it would cost to reproduce the properties now, . . . or even what a purchaser may have agreed to pay . . . , are too fanciful to warrant serious consideration." [23] Similarly, the SEC did not want the fair value or reproduction-cost measures of capitalization changes. A member of the SEC denounced the reproduction-cost measure, saying that it ". . . inevitably spawns the serpentine circle of higher rates followed by higher re-appraisals to support more security issues. . . ." [24] Commissions have good reasons for their objections to a reproduction-cost base. Either the reproduction-cost valuations are expensive and cannot be computed quickly, or they are superficial appraisals of property. A reproduction-cost base gives an upward bias to total capitalization; more securities are issued as construction costs increase, but security values are not scaled down as the construction costs decrease. And such a base, being higher generally than other cost bases, can be used by the companies to justify excessive past capitalizations of prospective earnings.

There are two common measures of the original cost of property. One of these is the accounting definition of original cost, the cost of property when it was first devoted to public utility service. The other, which is called investment cost, is the amount that the present company invests in property. When a company builds its own plant, the original cost and investment cost are the same. But when a company acquires part of its plant from another utility firm, the investment cost may be higher or lower than the original cost. Some state commissions try to equate the total capitalization and the investment cost of utility property.[25] The SEC also accepts an investment-cost change as a measure of a capitalization change. When a company invests in newly constructed property, the maximum increment in capitalization is the sum that is actually invested in the new property. And when the company acquires property from another utility company, a reasonable investment price is capitalizable; an arm's-length deal or even a reasonable transaction with an affiliated company is accepted. But some commissions want a first-cost standard: they want to make accounting adjustments so that the first original costs of properties are equal or nearly equal to the total capitalization. Contrasted with reproduction cost, the original cost and investment cost of property have some obvious practical advantages as measures of a reasonable capitalization. They are easily and inexpensively computed for most companies. And since the cost of property does not change after securities are sold and investments are made, this cost does not give an upward bias to the total capitalization. It is an inflexible measure of total capitalization, allowing increases in security values only when investments are made.

In Massachusetts, where conservative financial regulation has a longer history than in any other state, another standard of capitalization is used. The capitalization of a utility company is restricted to the amount of cash that investors contribute to the company. Original cost to investors rather than to the company is the Massachusetts standard of total capitalization. As a general rule the Massachusetts commissioners do not allow the capitalization of excess earnings. If a Massachusetts company earns more than enough to pay reasonable dividends, the excess is considered a contribution of the consumers; it belongs to the buyers rather than to the company. But the companies are encouraged to make investments out of earnings—to buy or construct plant additions rather than to pay more common-stock dividends. Being just as frugal as Yankees are supposed to be, the Massachusetts commissioners try to minimize the total capitalizations. This does not mean that they are stingy with utility-company investors. Earnings regulation is not separate from financial regulation; consumers are expected to pay enough for service to enable the companies to make interest and dividend payments.[26] Massachusetts commissioners want to support the total capitalizations and to maintain the credit standings of their companies. Yet they want total capitalizations that can be supported easily, that do not strain the finances of the companies, and that allow low rates for consumers.

Correction of Excessive Capitalizations. When the book valuation of new security issues is no higher than the investment cost (or the prudent investment cost) of property additions, increases in total capitalization are minimized. This restriction assures reasonable present and future changes in the total capitalization. But it does not correct an excessive capitalization that is a result of reckless or fraudulent past financing. If they want to correct existing capitalizations, commissions must effect readjustments of security values or let the companies go through corporate reorganizations. Regulators can effect capitalization readjustments in at least three ways: the book values of common stocks can be written down, stockholders (including holding companies) can contribute cash or securities, or earned surplus can be accumulated by withholding dividend payments. Aided by original-cost investigations of property values and ordering write-offs of excessive book values, the regulators of security issues have scaled down capitalizations of electric companies in all three ways. The SEC has approved several orders of the Federal Power Commission to write off excessive book values of property,[27] or has made its own property-value and capitalization revisions.[28] And the SEC and some state commissions (as described later) have restricted the dividend payments of operating companies. Indeed, some companies, foreseeing possible SEC restrictions of their dividend payments, have made voluntary readjustments of their capitalizations.[29]

Excessive capitalizations also can be corrected during corporate reorganizations. This is a slow way to make the changes, because receiverships are not yet common among the operating utility firms. An excessive capitalization is one cause of a company's going into a receivership; the firm needs to scale down its financial obligations. Bonds or notes come due and cannot be paid; interest charges cannot be paid; or arrearages of preferred stock dividends accumulate and impair the borrowing ability of the firm. State commissioners know that receiverships afford opportunities to establish reasonable capitalizations, but most of them do not take direct control of the financial changes. They let the trustees or conflicting classes of security holders work out the reorganization plans, and they leave judgments of the plans to the courts. The SEC and several state commissions, on the other hand, take an active interest in the receivership plans, and try to scale down the total capitalizations. If the SEC encounters a bad case of overcapitalization, it even suggests a reorganization and forbids the issuance of more securities until the overcapitalization is corrected.[30]

Since a general financial reorganization creates a new company with new security issues, this is the surest way to erase an excessive capitalization. A good reorganization plan, designed to prevent further receiverships, has a total capitalization that is based on a conservative estimate of future earnings. As the future earnings of a company are estimated, several facts are important: (1) the expected operating costs that are affected by labor union policies, tax changes, general market conditions for raw materials, and technical innovations, (2) the future demand conditions—including the possible improvements of substitute services, and (3) the probable severity of future price and earnings regulation. Approving a railroad reorganization that the Interstate Commerce Commission prepared for the Milwaukee system, the Supreme Court said,

> A basic requirement of any reorganization is the determination of a capitalization which makes it possible . . . to give the new company a reasonable prospect for survival. . . . Only "meticulous regard for earning capacity" . . . can give the new company some safeguards against the scourge of overcapitalization. Disregard of that method of valuation can only bring . . . "a harvest of barren regrets." [31]

This is the general view, too, of the SEC and some state commissions that insist on thorough reorganizations of utility firms. Dismissing rosy views of future earnings, these commissions allow the reorganized companies much smaller capitalizations than their predecessors had.[32]

Control of Acquisitions. When investments in property or security acquisitions are under consideration, a distinction is made, of course, between acquisitions from affiliated companies and those from independent companies. After 1930, which was the turning point in security regulation, commissions usually scrutinized property and security exchanges between affiliated companies.[33] And some commissions began to examine the arm's-length acquisitions of properties or securities; a few commissions not only investigate these acquisitions from independent parties, but occasionally revise the acquisition prices.[34] Among state and federal commissions a single standard of a reasonable acquisition price is not yet evident: some of them accept a prudent investment in a property or a security acquisition, while others prefer the first original cost that is used for accounting purposes. The Federal Power Commission is the strongest defender of the first-cost standard, though it allows amortization of the extra investment costs.* And the California Commission, which has used an original-cost base in both earnings and financial regulation for many years, writes off these excesses above original cost to earnings or surplus.[35] But the SEC, giving more attention to investment conditions and less to accounting procedures than some other commissions do, seems to be less insistent on a first-cost standard of acquisition prices. This commission approves prudent investments in property and securities,[36] though it sometimes requires adjustments of the book values of property.[37]

Security Prices. The total capitalization can be controlled, too, by regulating the selling prices of securities. If a commission can reduce the total selling costs of security issues, then the companies obviously realize some investment economies. The saving—the increase in the selling prices of securities—may be no larger than a dollar or two for each share or bond. Yet the aggregate saving on a 10-, 25-, or 50-million-dollar issue of securities is a large sum. State and federal commissions can effect these savings in several ways. Using a law that originally was passed before 1900, the Massachusetts Department of Public Utilities fixes the issuing prices of the common stocks of gas and electric companies. To fix these prices, the department gives attention to such facts as the company's dividend payments in previous years, the book values of the outstanding shares of common stock, the prospective earnings of the firm, and the expected market demand for common stocks.[38] Massachusetts regulators do not ignore general market forces, of course, as they determine the common-stock prices. Many other commissions apparently have the right to fix the issuing prices of securities. Occasionally they use the right,[39] but most of them, lacking exact knowledge of the demand for securities, rely on banker judgments rather than their own of market conditions as the security prices are fixed.

Competitive Bidding. Although only the Massachusetts Department regularly exercises direct control of new security prices, several commissions regulate the bankers' charges—the selling costs—for security flotations. The total of these charges commonly is known as the "underwriter's spread," the difference between the sum paid by the investor and that received by the company. Investment bankers contend that their profits always are spotty and never are excessive.[40] Yet the investment-banking houses certainly had opportunities to make excessive charges for their services before 1940. Investment bankers usually avoided competition with each other, important ones being affiliated with each other through security holdings, directorships of corporations, and personal or social contacts; they maintained reciprocal relations with each other, particularly in connection with syndicates; and they discouraged "shopping around" by the companies that had securities to sell.[41] A further reason for the noncompetitive pricing of securities was evident: banking houses often had exclusive control of the security sales of many utility companies, because they held voting shares of the operating companies or the holding companies.

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* The legal status of property exchanges between affiliated companies is not yet clear. Most commissions probably will approve higher prices for the acquisitions than the first original costs, though some of them may want to write off the extra property values to operating expenses.

Commissions can control the costs of security sales as each case arises. A state commission sometimes revises the underwriting charges, legal fees, and even the selling prices of bond and stock issues.[42] This kind of regulation is awkward and incomplete, however, because the state commissions do not control the investment banking houses and cannot easily fix the reasonable costs of security sales. Seeking more effective control of underwriting charges, regulators can require competitive bidding on all security issues. In 1919 the Massachusetts legislature required open bidding on gas and electric bonds. In 1926 the Interstate Commerce Commission started competitive bidding for equipment-trust securities.[43] During the mid-thirties the New Hampshire, District of Columbia, and Missouri Commissions ordered utility companies to submit their new security issues to competitive bidding.[44] And the Federal Power Commission adopted a similar regulation in 1939.

When the SEC required competitive bidding in 1941 and state commissions accepted the federal regulation, it became a general condition of new security sales.[45] Unable to condone further evidence of collusive security selling,[46] the SEC required competitive bidding for all issues of bonds, preferred stocks, and common stocks that exceeded a million dollars.[47] Before contracts for security sales are negotiated (or before exchanges of preferred stocks are arranged [48]), the companies ask for bids. Neither the companies nor the investment bankers can deliberately limit the competitive bidding.[49] The sales of utility securities, including the securities of operating companies that are subsidiaries of holding companies, are sold to the highest bidders just as bonds and notes of municipal, county, and state governments are commonly sold to the investment houses that pay the highest prices.

The dominant investment bankers, who are forced to compete with other banking houses, naturally are opposed to competitive bidding for public utility securities.[50] They say that the borrowers lose the useful services of investment experts. Under competitive bidding a banking house does not advise and influence utility companies as investment decisions are made; it is simply a buyer of securities. Large utility companies usually are able to make wise decisions. Small firms, on the contrary, may miss the advice of investment bankers. Some small companies are not subject, however, to SEC requirements for competitive bidding, because they do not sell million-dollar issues of securities. And if other small companies need closer banker relationships, the SEC can grant more exemptions from the competitive-bidding requirement. As a further argument, the companies and banking houses say that low-grade and junior securities are not well adapted to competitive bidding. If this is true, then the SEC can grant exemptions or make other allowances for the sale of these securities. There is a difference between no competitive bidding, which the banking and managerial interests want, and a flexible rule for competitive security sales.*

Competitive bidding for securities is a challenge to the concentrated control of a few banking houses. And it interferes with the price administration of the bankers, who are so few that they buy and sell under oligopolistic conditions. Even if the competition for security issues is imperfect, the competitive-bidding rule reduces managerial control of security prices. It sharpens the rivalry of bankers and insurance companies, and seems to reduce the costs of security sales. But the saving in security selling costs cannot be measured exactly. To make an accurate measurement, commissions must compare the selling costs of *identical* security issues under both competitive and noncompetitive conditions; but security issues are not standardized. Security costs must be computed before and after the introduction of competitive bidding; but capital markets are not alike at all times. Even though accurate tests cannot be made, some general evidence indicates a decrease in the security selling costs.[54] According to SEC information, the average selling cost of 159 bond issues before 1940 was 2.49 points ($2.49 per $100), whereas the average selling cost of 37 bond issues, which were sold under competitive bidding between 1941 and 1944, was 1.21 points.[55]

THE PROBLEM OF THE CAPITAL STRUCTURE

To achieve a well-rounded control of public utility finance, commissions must control the capital structures as well as the total capitalizations. The aggregate amount of securities is one problem; the choice between kinds of securities, particularly between debt securities and common stocks, is a complementary problem. When utility companies were allowed to build their own capital structures, they issued large amounts of bonds and preferred stocks and incurred large interest and fixed-dividend obligations. Now the commissions (particularly the SEC) commonly restrict the issuance of bonds, notes, and preferred stocks. Once the utility-company financiers issued many varieties of security issues, and created complicated capital structures. Now the commissions belatedly seek to eliminate special kinds of security issues and to simplify the capital structures.

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* Now and then the SEC exempts a security issue from the competitive-bidding requirement.[51] But most companies are required to seek competitive bids for security issues, even if the issues already are approved by state commissions.[52] Both the private sales, such as sales to insurance companies, and public sales through investment bankers are subject to competitive bidding.[53]

An Optimum Capital Structure. A concept of a balanced or optimum capital structure is basic in security regulation. The proportions between debt and stock issues determine, in part, the costs of capital, the chances of receivership, and the relations of the total capitalization to consumer prices. There are several kinds of optimum structures. One of these can be called the managerial structure. When financial regulation is ineffective, capital structures can be constructed that give benefits primarily to the owners of voting stocks. The voting stockholders select security issues that give them the largest dividends. Seeing opportunities to enlarge dividend payments, they sell additional securities and make additional investments. When these stockholders foresee an increment in earnings larger than that in capital costs, they approve the issuance of bonds. Then they are willing to "trade on the equity." And voting stockholders sometimes do not issue more common stocks (at least more voting stocks), because they want to protect their managerial positions. To hold managerial control of a company, they are willing to issue large amounts of bonds, notes, and preferred stocks, and to create high bond-stock ratios. Holding companies always tried to protect their small margins of voting control of operating companies. Operating companies often sold to the public bonds and preferred stocks rather than common stocks so that the managerial powers of holding companies remained intact.

An optimum capital structure also can be measured by the lowest *immediate* cost of capital. When each investment decision is made, the most economical borrowing is done. The company makes the most economical choices between common stocks, preferred stocks, short-term notes, and various kinds of bonds. Such a capital structure represents an accumulation of economical financial decisions, each of which was considered the best bargain at the time it was made. The immediate costs of borrowing often are used to justify the issuance of more bonds. Based on steady payments of interest and low risks of investment losses, bond prices usually are quite stable; sensitive to every real or prospective change in earnings, the prices of common stocks often have a wide range. Seeing what seem to be significant differences between bond and stock prices, the managers of utility companies are drawn to the sales of bonds rather than common stocks. The lowest price of borrowing is real and certain; financial troubles with bonds and notes are not certain, and do not occur at all unless demand and cost conditions become less favorable.

As utility companies build their capital structures, the immediate costs of capital seem to be the most important facts. Following a common judgment of capital structures, the companies often issue about 50 per cent of their total capitalizations in bonds, and divide the remainder approximately equally between preferred stocks and common stocks. One study, wherein the cost of capital is treated as a function of the total indebtedness, indicates that the average cost of capital declines until the debt securities are 45 to 50 per cent of the total capitalization.[56] A statistical study by the Federal Power Commission, which is based on the existing financial structures, shows how the bond-yield rates increase after the indebtedness exceeds about 40 per cent of the total capitalization.[57]

A third standard, designed to serve the social purposes of public utility operations and regulation, considers both the immediate and future investment conditions. The chances of receiverships or credit impairments are given important weights as the costs of capital are measured. Trying to protect the credit standings of companies, regulators try to be sure that technical innovations, service extensions, and pricing experiments are not deferred by financial troubles. If as they build capital structures companies and commissions are guided primarily by the immediate capital costs, a considerable amount of bonds, notes, and preferred stocks may be issued. Then the companies have large amounts of financial obligations. They must make interest payments periodically or go into receiverships; and they feel obligated to pay preferred dividends. Burdened with periodic interest and preferred dividend payments, the company managers act in a conservative manner. They are cautious about price experimentation, service changes, technical improvements, or plant expansion. But when common stocks are predominant in capital structures, the managers can take more chances from year to year. Avoiding the constant pressure for interest and preferred dividend payments, they can offer rate reductions to customers and can afford to wait several years for the full buyer responses to the price reductions. They can experiment with price changes. And they try out new kinds of service, or take larger chances on new service extensions.

Another social fact of financial regulation is important: avoidance of receiverships is beneficial to consumers as well as investors. Receiverships affect the quality of utility services and consumer prices. Before a company passes into the hands of receivers, it probably skimps on plant maintenance expenditures and puts off the installation of improvements. The company sacrifices service standards as it struggles to meet financial obligations and to avoid a reorganization. Moreover, when a firm is being reorganized, the trustees usually give attention to the new financial plan—to the new capitalization, the new capital structure, and the allocation of the new securities—and they neglect service improvements. At the same time the consumers may not receive any price reductions. Consumers clearly pay some of the costs of receiverships. Avoiding corporate reorganizations and interludes of no service improvements and only a few price revisions, consumers realize long-period benefits from common-stock financing.

Limitation of Indebtedness. Remembering earlier experiences with large amounts of debt securities, commissions try to improve the bond-stock ratios of utility companies. State commissions prefer capital structures that do not contain more than 50 or 60 per cent of debt securities.[58] Not only do state commissions criticize companies with large amounts of debt securities, but they sometimes refuse to approve increases in indebtedness.[59] Yet, even though a number of state commissions take an active interest in capital structure regulation, the SEC leads the drive to reduce the indebtedness of gas and electric firms. When the SEC describes the financial condition of a company, it usually expresses the bond, note, and stock capitalizations as percentages of the original cost of property. For some firms the book values of bond issues are more than 100 per cent of the original costs of the useful property. Although it sometimes approves larger amounts of indebtedness, the SEC does not favor a capital structure in which bonds and notes make up more than 50 per cent of the total capitalization. And in one case it suggests that the indebtedness should not exceed 35 to 45 per cent of the original cost of property.[60]

In the Consumers Power case the SEC reversed the opinion of a state commission,* and refused to allow a new issue of bonds.[61] The SEC held up the financial plight of railroad companies, particularly the low credit standings and the many receiverships of railroad systems, as a warning to the managers who continued to issue bonds. The commission thought that utility companies, acting wisely, had no more financial obligations than they could meet during a severe depression. To avoid credit impairments and receiverships, firms could consider the dangers of fixed financial obligations and make conservative estimates of future earnings. Even though the Consumers Power Company escaped financial troubles during the severe depression of the thirties, the SEC said,

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* Legal technicalities made this decision something less than a clear reversal of the opinion of the Michigan Commission. Since the company was organized in Maine instead of Michigan, it was not eligible for an exemption under Section 6 of the Holding Company Act.

But the pleasant past is not an adequate protection against what may be a less pleasant future. The rigidities created by past needless bond financing by then prosperous railroads account, in no small measure, for their present difficulties. Many railroads which successfully weathered earlier depressions did not fare well in recent times.[62]

As the Consumers Power decision indicates, the SEC believes that a company should not exhaust its ability to do debt financing. The indebtedness of a firm should not increase rapidly.[63] The SEC does not want to restrict debt financing after a danger point is reached—after the bonds cannot be called back and cannot be replaced, except in a reorganization, with common stocks. It takes a long view of utility company finance and capital cost, preferring the higher present cost of stock financing rather than future financial trouble with bonds and notes. When the Consumers Power case was decided, the SEC knew that the immediate capital cost of bond issues was lower than the immediate cost of common-stock borrowing. Yet the commission refused to approve a bond issue, and suggested the sale of common stocks, which at this time the company was able to undertake. Selling stocks instead of bonds, the firm could save its debt-borrowing ability for a later time.

The Consumers Power decision does not typify the work of the SEC. This decision expresses what the commission wishes to do, but does not tell what it must do. The SEC approves increases in indebtedness, even thought it does not like the increases. It approves new bond issues even after danger points apparently are reached in debt financing.[64] Sometimes the action of the SEC is restricted because a state commission approves the bond issue. Or an operating company may increase its indebtedness as it is divorced from a holding-company system; reorganization of the holding company is more important than the additional debt.[65] In other cases the companies cannot sell common stocks at reasonable prices.

The Special Case of Refunding. A special case of capital structure control arises as utility companies refund their outstanding debt securities. There are two common reasons for refunding bond and note issues. When bonds and notes mature and must be paid, new bonds and notes are sold and money is obtained for old bond and note payments. As utility companies grow older, the refunding of indebtedness is likely to be more common than the sale of new securities. Bond issues are refunded, too, when interest rates decrease sharply. Since this usually happens during a depression, the refunding of debt securities is more common during the contraction phase than during the expansion phase of a business cycle. New bonds are sold at low interest rates; the proceeds are used to call in the old, high-interest securities at premium prices; and the company reduces the annual interest charges. Refunding operations are either necessary or economical. When bond or note issues are due, they must be paid or the firm goes into a receivership. And when interest rates decrease, the company uses refunding operations to reduce the interest charges.

Until 1941 the SEC, like other commissions, treated refunding bond issues more generously than new bond issues.[66] In the El Paso decision, however, the SEC forewarned companies that this differentiation could be stopped.[67] The SEC said that it did not approve a refunding issue of bonds "*merely* because" it was a refunding issue. Again the commission presented the specter of the once optimistic railway financiers. Like the railway managers of another day, the officers of electric companies had ". . . an abiding faith in the permanency of existing generating and transmission facilities. . . ." The SEC observed that "too many utilities regard their debt as perpetual. . . ." Utility companies did not try to reduce their debts—to insulate themselves against the dangers of credit impairments and receiverships. Nor was the commission satisfied with the economies of refunding operations. Arguing against large amounts of debt securities, SEC said that

> replacing . . . existing debt . . . by common stock may be at an apparent "cost" of 9 or 10%, yet actually it may cost the issuer's stockholders nothing, and, moreover, may add a substantial margin of safety to . . . senior securities. On the other hand, a mere reduction in interest rates may be only an apparent benefit, creating the illusion that the capital structure is being strengthened . . . , but in reality perpetuating a top-heavy debt structure that subjects the company to the risk of default. . . .[68]

The SEC does not force companies to refund bond issues with common stocks. More stock issues are wanted, but the commission still accepts many bond issues for refunding purposes; the old capital structures of most firms are not altered. Even if the commission believes that it bears a "heavy responsibility for the perpetuation of such structures through refunding," the structures cannot be revised so easily as they are created. When a company wishes to refund outstanding bonds by issuing more bonds, the SEC can prohibit the issuance of bonds and propose the issuance of common stocks. If the company is not satisfied with this decision, it does not refund the outstanding bonds, and the interest charges are not reduced. Either the firm carries out the refunding operations with bond issues, or a reduction of interest charges is not realized. If the refunding of bonds with bonds is prohibited when a company wants to pay off a maturing bond issue, the system is driven into a receivership.

The SEC does not force companies into receiverships, even if this is the surest way to scale down the indebtedness. Despite the El Paso decision, this commission grudgingly approves the refunding of bonds with bonds.[69]

Financial Status of Preferred Stock. Just as a reduction of indebtedness is a good change for many utility firms, so a reduction of preferred stock issues often is desirable. Preferred stock is a fixed-return security for a prospering company.* Trying to protect its credit standing, a utility company wants to maintain the payments of preferred dividends. But the preferred stockholder often is in a poor financial position; his claims on earnings come after the claims of all debt holders. When the aggregate bond and note issues are large, preferred stockholders are assured regular dividends only when the earnings are large and quite stable. The owner of preferred stock may not think about his secondary, even tenuous position as long as dividends are paid. But when unpaid dividends begin to accumulate and when, in a later stage of financial troubles, a firm is reorganized, the unfortunate position of preferred stockholders is evident. If large arrearages of preferred dividends accumulate, a corporate reorganization is necessary because the borrowing capacity of the company is impaired. Wishing to reduce the fixed financial obligations and to minimize the chance of future reorganizations, the SEC discourages or even forbids the issuance of preferred stocks.[71]

Revisions of Capital Structures. To change the composition of capital structures, a commission can exercise two kinds of regulatory control. It can control carefully the issuance of new securities, trying to reduce the amount of bonds or preferred stocks and endeavoring to increase the amount of common stocks. This is the main way in which the state commissions attempt to revise capital structures—if they try at all. Using a second means of capital-structure alteration, commissions can control corporate reorganizations. When a utility company passes into the hands of receivers because it fails to pay its financial obligations or wishes to straighten out its financial troubles (e.g., the arrearages of preferred stock dividends), the commission can determine the kinds of securities that the new company can issue. In a single decision the commission can reduce the fixed financial charges and simplify the capital structure; one decision does what many decisions on successive security issues, strung out over a decade or two, can do. A third method can be used even if the company is solvent and does not need a thorough reorganization. This is a recapitalization of the firm. Seeing an unreasonable distribution of voting rights and wanting a larger ratio of common stocks to bonds, a commission can order the elimination of the old capital structure and the creation of a new structure. Recapitalizations, which the SEC orders commonly for holding companies and occasionally for operating subsidiaries, are discussed in the next chapter.

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* Taking advantage of lower yield rates, utility companies refinanced many preferred stock issues during the forties.[70] The dividend rates were reduced to less than 4½ per cent in most cases; dividend charges were economized with refinancing just as interest charges were reduced with bond refunding.

The Bond Indenture. As long as the capital structures of utility companies consist chiefly of debt securities and preferred stocks, the holders of these securities desire protection for their equities. A group of bondholders, such as holders of the first-mortgage bonds, want protection against dissipation of their assets—against the issuance of more first-mortgage bonds, or the payment of large dividends to common stockholders. The bond indenture affords protection to the bondholders. A detailed and carefully worded legal document, the indenture distinguishes the contractual rights of one group of bondholders from rights of other security holders. Indenture provisions cover the pledge of assets (a mortgage when real property is pledged), issuance of more securities under the indenture, maturity of the bonds, and establishment of a sinking fund or some other means of bond redemptions.[72] A trustee, appointed to supervise the enforcement of the indenture, represents the security holders as a group in any action that they have against the corporation.

Until security regulation of utility companies became vigorous, indentures were not closely examined by commissions. Under the old indentures the companies could issue additional bonds up to 70 or 80 per cent of the additional property values.[73] Indenture trusteeships were taken so lightly that the trustees acted in some instances as if they were agents of the corporations rather than representatives of the bondholders. Sometimes, in fact, indenture trustees held voting stocks of the company.[74] Then the SEC and some state commissions, such as the New York[75] and Wisconsin Commissions, began to control the provisions of indentures.* Today the SEC and several state commissions regularly examine the values of mortgaged properties, control the issuance of additional bonds under each mortgage, require sinking funds for most bond issues, specify provisions for depreciation and maintenance costs, and limit the payments of common-stock dividends. Seeking a sizable protective margin of earnings and assets above the bondholders' claims, the SEC has two conservative requirements for additional bond issues under a mortgage. According to one requirement a company can issue additional bonds up to 60 per cent of additional property values; the common limit is 60 per cent of the actual cost or fair value of additional property, whichever sum is the smallest. The other requirement is a minimum amount of net earnings in the preceding year: two times the annual interest charges on outstanding bonds after allowance is made for all costs including depreciation expense but not including income taxes. Next, the bond indentures commonly provide for the accumulation of sinking funds; the commission usually wants enough sinking-fund payments to the trustee so that at least 1 per cent of a bond issue can be retired each year.

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* The Trust Indenture Act of 1939 gave the SEC more authority over bond indentures, and required more responsible and active supervision of the indenture trustees.

Depreciation and Dividend Policies. Another fund is set up under the bond indentures that are regulated by the SEC and some state commissions. This fund commonly is called either a replacement fund or a maintenance fund; it makes a minimum cash provision for property deterioration, and thereby protects the equities of the bondholders. A common annual provision for a maintenance fund is 15 per cent of gross operating revenue, though a lump sum or a percentage of the mortgaged property value or the outstanding bonds sometimes is specified.[76] The whole 15 per cent of operating revenue is not paid, however, to the trustee; deductions are allowed for maintenance, replacement, new property, and bond-retirement expenditures.[77] Accumulation of a maintenance fund does not conflict directly with depreciation accounting; the maintenance fund is an asset and resembles a depreciation fund, while the charges to depreciation expense reduce the earned surplus. Payments into maintenance funds do not take the place of depreciation charges; the SEC, leading the way in bond indenture control, wishes to account as fully as the state commissions and the Federal Power Commission for plant deterioration.* But these payments are a cash form of depreciation accounting. And they have an indirect effect on earnings and price regulation. If 15 per cent of gross revenue is a large fund allowance for property depreciation, the requirement prevents a reduction of total revenue unless the price-control commission wants to deprive a company of necessary cash or reasonable dividend payments. The SEC, wanting to accumulate funds so that investment values are securely protected, does not attempt to minimize the reasonable total costs of service; other commissions prefer conservative accounting for depreciation, but they draw a line on depreciation charges and try to provide low-priced service for consumers.

Protecting the claims of bondholders and trying to prevent future financial troubles, commissions exercise direct control of common-stock dividends. Utility companies, like other American corporations, are expected to pay common dividends out of earned surplus.[80] Provision for dividend payments out of earned surplus is a standard part of a bond indenture. And as the SEC measures the net income available for common dividend payments, it usually requires a total provision for maintenance expenditures and depreciation charges that equals or exceeds 15 per cent of operating revenue. Approving new bond issues, the SEC also requires some companies to pay common dividends out of the earned surplus that is accumulated after the new bonds are sold.[81] Sometimes the commissions approve undesirable issues of new or refunding bonds, but restrict the payments of common-stock dividends. Commissions commonly do not favor dividend payments up to the limit of annual earnings. And they believe that a company should not use all of its cash funds for these payments, even if plenty of earned surplus is left after the dividends are paid.

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* Following a conservative financial policy, the SEC wants liberal charges for depreciation expense as well as substantial payments into the maintenance funds. It asks some companies to make larger charges to depreciation expense,[78] or to increase their depreciation reserves.[79]

There are several more kinds of dividend restrictions. Sometimes the dividend payments are restricted to no more than the "prudent needs" of companies; [82] or they are limited to 50 or 75 per cent of the net earnings that are available for dividends.[83] When companies have unsatisfactory dividend histories, they sometimes are required to give notices to commissions of dividend payments.[84] Wishing to protect the financial "cushion" of senior security holders, some commissions prescribe minimum amounts of earned surplus that must be available before dividends can be paid.[85] Payment of dividends occasionally is prohibited, furthermore, until the companies can reduce their debts.[86] And when receiverships are pending or when the capital structures are unsound, companies are limited to dividend payments that are certain percentages of the current earnings.[87] If more vigorous action is required, the commissions stop all dividend payments for an indefinite time.[88] The Wisconsin Commission started to use "stop" dividend orders in 1932.[89] Graded according to the need for regulatory action, these dividend controls are evidence of forceful financial regulation, of a long regulatory view for public utility finance.

THE DECLINE OF THE FINANCIER

Once the promoters and financiers, exploiting their freedom under the old economic liberalism, managed the capitalization, capital structure, and dividend policies of utility companies while the state commissions usually were content to determine reasonable earnings at infrequent intervals. Now the regulators, led by the SEC, are imposing social rules of public utility finance; the private financier is still a supplier of funds, but he is not the dominant manager that he once was. Both the federal and state commissioners recognize today that changes in total capitalizations, choices of securities, and payments of dividends can affect the prices of service or even the expansion and improvement of service because they influence the financial future of private firms. Consequently the commissions try to minimize the amounts of new security issues, require competitive bidding among investment bankers, attempt to restrict the issuance of more debt securities, give careful attention to corporate reorganizations, tighten up the provisions of bond indentures, and limit the payments of common-stock dividends. Using these social controls, they protect the equities of nonvoting security holders, reduce the chances of future financial troubles, and economize the capital costs of production.

Chapter 8

Corporate Integration

A COMMON historical event in utility industries was the unification of operating companies. Prospective demand changes, technical innovations in service production, economies of large-scale management, domination of markets—these were common reasons for the creation of larger and larger operating systems. Each industry started with a number of small systems that served single villages or parts of large cities; next, enterprising financiers bought or consolidated the adjacent local systems; then local companies, particularly in the electric, natural gas, and telephone industries, were brought together to make metropolitan, regional, or state-wide systems. Street railways and gas systems commonly were unified in most cities before state commissions began to regulate; regional telephone systems, which were parts of the AT&T organization, developed before the First World War; and unification of electric operating systems followed the technical improvements in electricity generation and transmission, and proceeded rapidly after the war.

While operating companies expanded and were consolidated, another kind of unification occurred. Holding companies were organized. Acquiring the voting securities of operating companies, the holding companies often became the managers of utility services. Requiring smaller investments than mergers and being easy to organize, they were expedient, economical means of unification. Their investments could be confined to the voting stocks of operating companies, and managerial control could be extended to many firms. A single holding company, AT&T, became dominant in the telephone industry, and a few companies controlled a large part of the electric and gas industries. Being easily organized, financed, and enlarged, some holding companies, particularly in the electric and gas industries, expanded recklessly, practiced pyramiding, were overcapitalized, and exploited operating systems. A corporate structure often contained several tiers of holding companies; high prices were paid for properties and securities; asset values were written up; voting rights were unevenly distributed. Seeing these financial manipulations, the federal government began to regulate and to reorganize the gas and electric holding companies in 1935.

STATE CONTROL OF UNIFICATIONS

Before 1930 the state commissions did not carefully regulate the unifications of operating companies. Some commissions did not have specific statutory control of property and security acquisitions, mergers, and consolidations. But most of them could control unifications indirectly, because they could regulate the new issues of securities. They did not lack regulatory powers so much as they lacked perception, a strong feeling of public responsibility, and vigor. Approving the acquisition and consolidation plans of financiers, they went along with the "modern tendency."[1] Some commissions, like the Connecticut Commission, never rejected a consolidation or merger plan.[2] After many unifications were effected and after corporate structures and operating systems were built up, some state regulators tightened their unification controls. This regulation came too late. The commissions could not change the misshapen operating systems, unless new regulatory powers and larger staffs were provided by the legislatures and unless a general reorganization of the established systems was undertaken.

Property and Security Exchanges. State commissions did not control directly the negotiations for corporate consolidations, or for property and security exchanges. They did not fix the prices for these transactions. If the commissions exercised any financial controls at all, they regulated the security issues with which the acquisitions, mergers, and consolidations were financed. Yet most of them did not carefully restrict the total capitalization changes. A company bought securities or physical properties or arranged a merger; then the commission approved the security issues that the company wanted to sell or exchange. Before 1930 financial arrangements for unifications commonly were handled by private interests; nearly all commissions gave quick, official approvals of the arrangements. Competitive bidding for outstanding securities and operating properties, write-ups of asset values, the fast pace of unification changes, and the brief opinions of commissions were evidence of indifferent capitalization controls. Some commissions recognized the high prices and approved them. Even though there were no arm's-length negotiations or no chances for fair returns on investment costs, commissions approved acquisitions.[3] The New York Commission said, "In the absence of . . . bad faith or collusion, it must be presumed that . . . [the company] is exercising a reasonable business judgment. . . ."[4]

Before 1930 some commissions loosely limited the total capitalization changes that were associated with unifications. One restriction was common among these commissions: companies were allowed to capitalize no more than the book values or present values of the acquired properties.[5] But this was an inadequate control of capitalization changes, because the book values of properties often were inflated and companies could imagine or give engineering evidence of high present property valuations. A few commissions were not so generous. The California Commission, for instance, permitted capitalization of only the original cost of a property acquisition.[6] As unifications were effected now and then after 1930, companies commonly were subjected to more stringent capitalization controls. The present value standard was not respected in either financial or earnings regulation; commissions saw the effects, the receiverships, and the excessive capitalizations of their indifferent regulation; and the Securities and Exchange Commission set a new, high standard of security control that made the state commissions strive for some improvements. Using the new accounting data for asset values, the state regulators shifted toward an original-cost or investment-cost basis of capitalization changes.[7]

Other Financial Considerations. Promoters of utility company unifications, like promoters in general, were not always interested in more efficient operating systems. They sought financial advantages. Acquiring operating properties and consolidating companies, they obtained access to more revenue and realized chances for larger profits. As a consequence of consolidation and capitalization changes, financiers could increase or economize their voting controls of utility operations. To obtain funds cheaply, promoters thought that a large system, known to investors and occupying a large territory, was necessary. A financial group often wished to assemble an attractive bundle of properties and then sell the assembled system at a profit. When unifications of utility properties were common financial events, many commissions did not distinguish between benefits for financiers and benefits for consumers. The motives of financiers were not closely scrutinized. Yet commissions did consider the financial effects of some unifications, though they commonly accepted the evidence of the financial groups. They approved unifications because managerial, labor, and technical economies might be effected.[8] Or mergers were approved when a financially stronger company was anticipated, or when the acquired company needed funds for plant expansion.[9]

Even during the twenties a few commissions rejected some kinds of unifications. The New York Commission, for example, did not approve voting stock acquisitions by "unnecessary" holding companies.[10] Several commissions refused to approve property or security sales to nonresident corporations.[11] If commissions approved unifications after 1930, companies often were expected to show evidence of real financial improvements. Commissions disliked acquisitions and mergers that did not strengthen the earnings prospects and credit standings of the acquiring firms, or did not reduce the costs of capital.[12] Objections also were made to unifications that provided only corporate benefits, that were useful to the companies or the voting stockholders rather than the consumers.[13]

Market Domination. When utility companies and financial interests bought operating properties or merged other companies into their systems, a common objective was control of larger markets. They wished to get ahead of other companies in the occupation of additional markets. Because commissions and cities usually admitted only one utility firm to each market, a company could not defer its decisions about market expansion. A firm acquired municipal plants or available private companies quickly; or it conceded the possible market additions to other systems. Managerial and banking interests were forced, indeed, to look beyond immediate economies (or diseconomies) of unifications. They were forced to take chances on future technical changes, managerial economies, and regulation of widespread systems. And sometimes, as in the electric industry during the twenties, competitive bidding for plants and securities was common. When long-distance transmission of electricity became economical and many towns could be served from the same generating plant, there was a rush to buy small electric systems. Seeing the same opportunities for profitable unifications, rival financial groups bid up the prices of operating properties, the efficient as well as the obsolete properties.

For a long time the commissions did not limit the size of operating systems or try to check the interest in market domination. A financier could merge many operating systems into an extensive system. Local telephone service was concentrated in large, regional Bell systems, though much of this unification occurred before the state commissions began to regulate. In some states a single company performed a large part or nearly all of the electric service. State-wide systems were organized in Montana, Utah, Georgia, Alabama, and Mississippi. Even though the large, ably directed companies might be difficult to regulate, the commissions did not try to thwart the private objectives of market domination. Several commissions said, indeed, that "mere size" was not an undesirable characteristic of unification plans.[14] During the depressed thirties a few commissions began to show an aversion to large-sized systems,[15] but most commissions still expressed no strong opposition to extensive companies.

Technical Economies. Mechanical innovations, affording economies of large-scale operation, probably were the most important forces behind the unification changes. These effects of technological changes were well demonstrated in the electric industry. As technical improvements appeared or were anticipated in the generation and transmission of electricity, operating properties were put into larger and larger systems. Like the company managers and investors, the commissions usually expected cost economies and lower prices from expanding companies. Taking over an isolated local plant, a large electric system could promise fewer service interruptions. Interconnection of generating plants was a good unification argument in the electric industry. Similarly, in the water industry a large system, serving a cluster of towns and cities, could afford to develop a dependable source of water.[16] On the contrary, commissions naturally could not see significant unification economies for scattered properties.[17]

No state commission had a general integration plan for operating systems. Before consolidation, merger, and acquisition cases were decided, commissions did not divide their states into operating areas most conducive to economical allocations of markets. Taking account of existing or prospective techniques of production, they could outline the optimum operating systems. The ideal arrangement was easily stated: each town or rural area was served by the system that could perform the service most cheaply. As technical knowledge or managerial proficiency changed, the ideal allocations could be revised and larger (or smaller) systems could be approved. Perfect allocations obviously were impossible; regulators never could interpret technical conditions so expertly or get so much cost data that indisputable choices could be made. In most situations they could make only rough calculations of economical market divisions. But commissions were not even interested in general market allocations. Indeed, it was not even evident that they understood the difference between a technical or economic optimum, controlled by marginal operating costs, and a financier's more complex optimum that went beyond production economies and included an expanding authority over markets, competitors, security transactions, and dividend payments. Avoiding rough measures of optimum operating systems, commissions made case-by-case decisions on plans that the private interests worked out. Consequently the objective of market domination was not curbed, rival companies were encouraged to bid for the same properties, and technical improvements were not always used most efficiently.

After most of the unifications were effected, technical efficiency became a more important condition of control. Commissions still did not measure the optimum divisions of their markets,[18] but they gave more attention to the technical integration of operating properties. The Pennsylvania Commission, for example, rejected a proposed merger of two affiliated electric companies when they served different kinds of customers, and when the company plans did not show how the systems could be "interconnected . . . as a composite whole."[19] Commissions often examined the anticipated economies of mergers, and rejected proposals that did not promise more than small operating economies.[20] Indeed, the New York Commission, which changed its ways in unification regulation, said that large-scale economies could be exaggerated, because ". . . in very large organizations the personal touch is lacking. . . ."[21]

Consumer Benefits. As systems were unified and as the scale of operation was enlarged, commissions apparently thought about service improvements and possible rate reductions. They meant to translate unification economies into lower consumer prices, though before 1930 a few commissions were skeptical about the chances for price reductions. An Indiana commissioner, for instance, said that ". . . merged properties usually ask for rate increases."[22] Other commissions apparently expected lower prices, even if some companies were trying to dominate markets rather than to construct the most economical operating systems. Even when the companies were allowed to capitalize the fair values, inflated book values, or unadjusted purchase prices of their property acquisitions, the commissions did not deliberately neglect consumer interests.[23] They simply failed to see a connection between capitalization changes and price changes.[24] Their intentions were good, but their regulations were weak.

When unification plans were presented to commissions after 1930, the consumer interests were more carefully protected. Remembering their depression experiences with overcapitalized companies, commissions saw a connection between capitalization changes and consumer prices. And they were less inclined to accept the prediction of a company that consumers could get lower prices in the future. Unless the companies presented convincing evidence of significant economies and showed real bases for rate reductions, unification proposals often were rejected.[25] But the regulatory improvements, like most significant changes in democratic government, were deferred a long time. A private pattern of unification, guided by the market domination objective as well as technical economies of production, was firmly established. There were small, local systems as well as large, state-wide systems; some systems were compact and well integrated, while others had irregular shapes and were relatively inefficient. Utility markets were not divided in the most economical manner. To correct the past errors and to make full use of production techniques, state commissions could seek authority to reorganize operating systems. And they could study the technical, financial, and managerial conditions of production, looking toward the most economical uses of resources, extensions of service, and further price reductions for consumers. But the commissioners, being satisfied to leave well enough alone, were reluctant to take on the large reorganization job.

INTEGRATION OF HOLDING COMPANIES

A few state commissions closely regulated unifications of operating companies before 1930. But the financial transactions of holding companies were not subject to any public control. This was a mistake. Although some holding companies were managed originally in a respectable and socially useful manner, they usually became financial devices by which investors, operating companies, and consumers were exploited. Between 1920 and 1930 the holding companies bid competitively and recklessly for more properties and voting securities, buying properties and securities wherever they could find them and checkmating the development of each other. Write-ups of the book values of properties and securities were common. Pyramiding was a universal characteristic of utility holding companies; preferred stocks and bonds were sold to the public, and the holding companies held chiefly the common stocks of operating companies.* When several tiers—even four or five—of holding companies were built up in a single corporate system, a small investment in the top holding company controlled a large investment in operating plants. Having pyramided financial structures, holding companies were reliant on steady, large dividends from operating companies; otherwise they could not pay the interest on their bonds and bank loans, or the dividends on their preferred stocks.

The manipulations of holding companies, which frequently were beneficial to no one except the inside financial interests, were evident long before the business collapse in 1929 checked the mad speculation. Economic or technical considerations did not guide the development of many gas and electric holding companies. These companies usually did not have compact, interconnected operating systems; rather, the operating subsidiaries were scattered through several states—sometimes throughout the United States and adjacent foreign countries. Next, absentee control of electric and gas service, vested frequently in investment bankers and centered in New York and Chicago, became common. Investment banking groups wished to dominate the good markets for utility services; they desired dividends, control of security flotations, and managerial authority over prospering companies. Their domination grew so rapidly that in 1929 the three largest holding companies controlled nearly half of the electricity sales. And the fifteen largest systems controlled about 80 per cent of the total electricity sales.[26] Even super-holding companies, such as the United Corporation which was organized by the Morgan banking interests, began to develop.

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* Pyramiding, a means of exploitation for the voting stockholders, is described in Chap. 5 where the unregulated behavior of holding companies is outlined to show how federal regulation was provoked.

The Legislation. Congress became interested in the holding-company problem during the late twenties. The Federal Trade Commission was authorized to study holding companies in the electric and gas industries, and the investigation began in 1928. Gathering many accounting, financial, and regulatory details, the Trade Commission spent about nine years on the job and made nearly one hundred reports. This was the most intensive investigation of an American industry that ever was made. It was the factual basis for legislation. Legislative plans were handled by the National Power Policy Committee whose chairman was Harold Ickes, the Secretary of the Interior. Making a report in March, 1935, this committee recommended the "practical elimination" of useless holding companies.[27] The great economic collapse of the early thirties provided, meanwhile, the right political environment for vigorous action against holding companies. Lacking dividends from operating subsidiaries, some holding companies went into receivership. The collapse of the Insull system and the fraud in the Foshay and Associated Gas and Electric systems attracted national attention. Other holding companies accumulated large amounts of unpaid preferred dividends, and faced eventual reorganizations. Consumers, state commissioners, disappointed investors, legislators—nearly everyone except the holding-company financiers—were ready for holding-company regulation.

After the Holding Company Act was passed in August, 1935,[28] the Securities and Exchange Commission became a powerful regulator of gas and electric holding companies and their subsidiaries. Holding companies were required to register with the SEC. The core of the act was Section 11 that called for integration and financial reorganization of holding-company systems.* A holding company was conservatively defined. It was a company that held or controlled 10 per cent or more of the outstanding voting securities of an electric or gas company, or that exercised, directly or indirectly, a "controlling influence over the management or policies" of any electric or gas operating company, or another holding company. Some holding companies were automatically eliminated by the act. More than two tiers of holding companies were forbidden; an operating company could have a grandfather company, but it could not have a great-grandfather. Other holding companies were subject to financial reorganizations. The SEC was expected to regulate so that "unnecessary" complications of capital structures or "unfair" distributions of voting rights were eliminated. Companies were given one year to comply with either the integration or the financial revision orders, though time extensions were permissible. And if a company refused to respect an order, the SEC was authorized to ask for court enforcement and the appointment of a trustee.

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* At first the Senate and House of Representatives did not agree on the integration section. The Senate wanted to eliminate all holding companies except the "necessary" ones. But the House adopted a modified Section 11, and was willing to retain the holding companies that were operating in the "public interest." A compromise section was worked out which specified more definitely the conditions of integration, and allowed the continuation of some holding companies.

The Holding Company Act was a severe law. It was the most stringent, corrective legislation that ever was enacted against an American industry. Yet forceful action was needed to straighten out the corporate organization and control of the electric and gas industries. The remedy was suited to the patient. Many holding companies were dissolved, partially liquidated, or reorganized. Unified, technically related systems replaced systems of scattered, disconnected properties; economical organizations replaced conglomerate financial arrangements that served the interests of financiers. Investment banker control of electric and gas industries was eliminated or modified; and the engineer became more important. Being dismembered by the SEC, a dozen holding companies did not dominate the electric and gas industries. There was a shift, too, toward localized management; New York and Chicago became less common centers of final corporate authority.

The Supreme Court also believed that the remedial legislation was not too severe. In the North American case the company, whose system was one of the largest in the electric and gas industry, saw the ownership of securities as something apart from interstate commerce.[29] But the Court saw the security holdings as a means of managerial control—as ways to perpetrate the evils that Congress wanted to eradicate. Approving the Holding Company Act, the Supreme Court said the social defects connected with uncoordinated systems

> . . . were found to be polluting the channels of interstate commerce. . . . Congress also found that the national welfare was thereby harmed, as well as the interests of investors and consumers. These evils, moreover, were traceable in large part to the nature and extent of the securities owned by the holding companies. Congress therefore had power under the commerce clause to attempt to remove those evils by ordering the holding companies to divest themselves of the securities that made such evils possible.[30]

Dissolution of Holding Companies. Before the SEC began to enforce the requirements of technical integration and corporate reorganization, more than 50 systems were subject to regulation. In 1940 there were 144 registered holding companies,* constituting 55 systems that included 1,493 holding, subholding, and operating companies.[32] When the Holding Company Act was passed in 1935, Congress intended to eliminate some of these holding companies. Many of them were dissolved. Merging with their subsidiaries, some firms ceased to be holding companies and were not subject to the act. Other companies sold or distributed the voting stocks of their subsidiaries. Trying to escape regulation by the SEC, companies also could reduce their stock holdings and become investment firms. Because some systems had more than two tiers of holding companies, part of those registered were forced to dissolve. And when the holding companies seemed to be useless, other dissolutions were ordered by the SEC.

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* In 1938 the registration requirement was upheld by the Supreme Court.[31]

A consolidation of the operating subsidiaries and an elimination of the holding company took place in the Lone Star system.[33] A holding company, the Lone Star Gas Corporation, owned nearly all the securities of several firms that produced and distributed gas in northern Texas. The assets and liabilities of the subsidiaries were transferred to a new corporation; next, the holding company (the Lone Star Gas Corporation) received from the new firm stocks of a par value equal to the net book value of the transferred assets; then the holding company distributed the new-company shares to its stockholders and was dissolved. This was an easy reorganization, because the holding company owned nearly all the outstanding subsidiary securities—because pyramiding was not practiced by the system. Similarly, when the Standard Oil Company of New Jersey organized a new holding company for several natural gas firms and distributed the new-company stocks to its own shareholders, it ceased to be a holding company.[34] In other cases, too, the holding companies were turned into operating firms when they were merged with their subsidiaries.[35] But these mergers, which required large investments in operating properties, apparently were too expensive for many thinly financed holding companies.

A holding company also can be changed into an investment company. To accomplish this alteration, the company must fulfill two statutory conditions; it must own less than 10 per cent of the voting securities that are issued by any operating firm or other holding company in the corporate system, and it must not exercise any "controlling influence over the management or policies" of these subsidiaries. The United Corporation, an important eastern holding company which was organized and controlled by the Morgan banking house, proposed such a revision. This company was willing to sell, exchange, or distribute enough voting stocks of subsidiaries till it had less than 10 per cent of the voting securities of any firm.[36] Seeking to eliminate holding companies as often as possible, the SEC approved the general idea of an investment company. The commission also wanted to eliminate the United Corporation as a holding company, because it violated the "grandfather" clause, performed no important services for subsidiary firms, had a pyramided capital structure, and did not distribute voting rights equitably among the security holders. But the SEC did not approve the plan of the company. Even if the stock holdings were reduced, the firm still could exercise "controlling influence" over the subsidiaries.[37] Even if the voting control was reduced below 10 per cent, the United Corporation still was the largest single stockholder of the subsidiaries, because the remaining shares of stock were widely distributed.

Some holding companies were voluntarily liquidated, because their owners could not see attractive operating systems that satisfied the integration requirements of Section 11. These owners preferred to sell plants or securities, pay off their security holders, and dissolve the holding companies. According to the SEC, the "break-up value" of the North Continent system was "substantially greater than the value of [the] . . . assets on a going-concern basis."[38] The dismemberment of the Great Lakes system also illustrated the voluntary liquidation procedure.[39] A small holding company, the Great Lakes Utilities Company, owned the voting securities of small, scattered gas plants located in Virginia, Ohio, Michigan, Illinois, Iowa, and South Dakota. Except for the Michigan companies, none of these properties seemed to offer attractive opportunities for an integrated system. But even the Michigan companies were not retained. Facing the approaching maturity of a bond issue, the company preferred to sell all its investments and pay off its security holders.

Some holding companies were dissolved because too many were functioning within the corporate systems. The SEC was authorized to forbid more than two tiers of holding companies. If the firms did not voluntarily undertake simplification of their corporate structures, the SEC ordered the dissolution of extra holding companies.[40] The SEC also has authority to eliminate other holding companies—the unnecessary companies. Section 11(2) says that the commission ". . . shall take . . . steps . . . to ensure that the . . . continued existence of any company [exclusive of operating companies] in the holding-company system does not unduly or unnecessarily complicate the structure, or unfairly . . . distribute voting power among security holders. . . ." Thus the SEC can challenge the existence of any holding company in the electric and gas industries. If the commission finds useless companies or if the firms have complicated and pyramided capital structures or have inequitable distributions of voting rights, the SEC can eliminate them. All the holding companies in a corporate system, in fact, can be dissolved. These broad powers are upheld by the courts.[41]

Now and then the SEC orders the dissolution of the unnecessary, improperly financed companies.[42] Sometimes the top holding companies are dissolved; in other cases the subholding companies are eliminated. Forming a factual basis for dissolution orders, the commission examines the holding-company services for operating plants, past financial practices, and the current financial condition of the holding companies. Unless the holding company provides some necessary and economical managerial services for operating firms or furnishes funds for plant expansion, it may be eliminated.* A past record of write-ups of asset values, pyramiding, overcapitalization, and other objectionable financial practices is influential evidence. The commission dislikes the capital structures of holding companies that contain debt securities, bank loans, or large amounts of preferred stocks. And it studies the distribution of voting powers, putting emphasis on the relation between the holding-company investment and the total system investment. Eliminating corporate shells or flimsy corporate structures, the SEC does not believe that it destroys valuable things.

The basis for a dissolution order was illustrated in the American Power & Light decision.[44] This company was a subholding company in the Electric Bond & Share system, and controlled many firms that were scattered throughout the United States. Between 1917 and 1935 American Power & Light could not perform any managerial services for subsidiaries, because it did not have a single employee. Wishing to make a better showing before the SEC, the parent holding company gave the American Company a small office force in 1935. No substantial amounts of capital funds were furnished to the subsidiaries; the American Company bought the common stocks of subsidiaries only four times during a 32-year period. Write-ups of asset values and security values were common; a pyramided capital structure, top-heavy with bonds and preferred stocks, was constructed; and unpaid dividends on preferred stocks accumulated after 1932. Finally the investment in subsidiary firms, adjusted for write-ups, was only 21 per cent of the total investment. Seeing these conditions, the SEC decided that the dissolution of the American Company, like that of associate companies, destroyed a "useless, cancerous growth." [45]

When the Supreme Court decided the American Power & Light case in 1946, it approved the commission's choice of dissolution and gave further support to the holding-company law.[45a] Recognizing the Congressional provision for the dissolution remedy, giving the "greatest weight" to the commission's judgment, and seeing the mere "paper" existence of the holding companies, the Court said, "Elimination of useless holding companies may be carried out by fair and equitable methods so as to destroy nothing of real value." It saw no "legitimate functional purpose" for the company—only a "mechanism by which Bond and Share [the parent holding company] maintains a pyramided structure."

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* When a holding company has only one subsidiary, the SEC doubts that the company serves any useful purpose.[43]

When a holding company is dissolved voluntarily or by a commission order and when the company has two or more kinds of outstanding securities, another regulatory problem must be solved.[46] This is the allocation of holding-company assets to the different security holders. Perhaps the portfolio of subsidiary securities is sold, leaving cash for liquidating dividends; or the company may allocate the subsidiary stocks directly to its security holders. These allocations of available assets, which resemble the security allocations of receivership reorganizations, are regulated by the SEC. Following the rule of absolute priorities, the commission allocates cash or securities according to the order of contractual rights. The values of bondholder's claims, which may be higher than the face values of the bonds,[47] are satisfied first; then preferred stockholders receive liquidating dividends; and if any assets are left, the common stockholders receive cash or securities. To determine the total value of holding-company investments, the SEC estimates the prospective revenue (dividends) from subsidiaries. If the value of the investments is high, the common stockholders of the holding company get some cash or securities. In the United Light & Power case, for example, the commission gave the common stockholders a share (5 per cent) of the available subsidiary securities, even though the company had large amounts of unpaid preferred dividends.[48] Despite the large prior claim of the preferred stockholders, the commission believed that the common stockholders had a chance for dividends in future years.

Geographic Integration. The selection of integrated utility systems, which is controlled mainly by technical and economic conditions rather than financial conditions, is the critical part of holding-company reorganizations. No part of the Holding Company Act is so important as Section 11(b)(1). According to this section, a holding company must be confined to an integrated system—to a compact, localized, and efficient operating system rather than widely scattered, disconnected operating properties. A holding company can be limited to what is called a *principal* integrated system; it can be restricted to a "single integrated public-utility system." The law also says that a holding company can "control one or more additional integrated public-utility systems" under certain conditions. Additional integrated systems can be controlled, if the SEC finds that

> (A) Each of such additional systems cannot be operated as an independent system without the loss of substantial economies . . . ;
>
> (B) All of such additional systems are located in one State, or in adjoining States, or in a contiguous foreign country; and

(C) The continued combination of such systems under the control of such holding company is not so large (considering the state of the art and the area or region affected) as to impair the advantages of localized management, efficient operation, or the effectiveness of regulation.

Holding companies could voluntarily submit integration plans, or the SEC could order an investigation and reorganization. Only a few systems offered their own plans before 1940. One of them, the American Waterworks and Electric Company, suggested a plan in 1937; it proposed an electric system of three subsidiaries that operated in Virginia, Maryland, West Virginia, and Pennsylvania.[49] The SEC did not start formal integration proceedings against any company until 1940. Then it issued numerous "show cause" orders, asking for evidence on why the holding-company systems should not be revised. Hearings, integration orders, and the break-ups of holding-company systems were not stopped during the war. Before the war ended, the commission outlined most of the coordinated systems and some companies completed their integration changes.

An interpretation of Section 11 was the most important problem of the SEC. Congress said that an integrated electric system consisted of

> . . . one or more units of generating plants and/or transmission lines and/or distribution facilities, whose utility assets . . . are physically interconnected or capable of physical interconnection and which under normal conditions may be economically operated as a single interconnected and coordinated system confined in its operations to a single area or region . . . , not so large as to impair . . . the advantages of localized management, efficient operation, and the effectiveness of regulation. . . .*

The meaning of such phrases as "capable of physical interconnection," "localized management," or "efficient operation" were subject to different interpretations. A more important question was the relation between the principal integrated system and the additional integrated system or systems. How many systems could a holding company have, and what conditions controlled the selection of them? Since the "loss of substantial economies" was not explicitly defined by Congress, the "A" condition was subject to several possible interpretations. The "B" conditions, which concerned the location of additional systems, could be construed in different ways: they could mean that the additional and principal systems were located in the same state or adjoining states, or that at least one state lay between the principal and additional systems. And the "C" conditions, too, were not self-explanatory.

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* This definition, as well as a definition of an integrated gas system, is given in Section 2(29) of the act. The definition of an integrated gas system contains no provision, of course, about interconnections as an allowance for the technical character of gas manufacturing plants.

The holding-company managers and investors naturally wanted a liberal interpretation of an integrated system. Both gas and electric properties, they believed, were properly kept within a system; and to prove their point, they described the economies of joint management of electric and gas service. Trying to save the largest possible part of their systems, the holding companies also argued for a two-area organization or regional interpretation of Section 11. They asked for two integrated systems, a principal system and an additional system, even if the systems were in different parts of the country. The Engineers Public Service Company, for example, wanted to put two separate systems together and to call them an integrated system; one electric and gas system was located in Virginia, the other operated in the Gulf States.[50] Holding companies tried to show how a two-area or regional organization provided managerial economies, better financial connections, and even ultimate possibilities of physical interconnection. They wanted to control large parts of all of their established systems; they were more interested in financial controls and their own corporate lives than in economical utility service.

Seeking compact systems, technical economies of production, localized management, and better opportunities for earnings and price regulation, the SEC gives a strict meaning to the integration provisions. The principal system must be a technically connected organization, or it must be clearly capable of technical unification. And it must not be so large that local management cannot be effected. When a company wishes to include an additional system, it must meet all of the A, B, and C conditions. Taking this view, the SEC commonly insists on a one-area location for the principal and additional systems. The additional system (or systems) must be located in the same state as the principal system, or it must be in the state that is adjacent to the location of the principal system. Nor is the SEC easily convinced that substantial economies are lost when holding-company organizations are broken up. At any rate, the commission approves the retention of additional systems only when important economies are foreseeable.[51] And both a gas system and an electric system cannot be retained by a holding company unless one of them is small.

Holding-company control of both electric and gas operations is a special integration problem. An operating company often sells both electric and gas service, or a holding company may control electric and gas companies that operate in the same market. Under these conditions the electric and gas services are jointly managed in the same market area. The SEC does not always approve holding-company control of both services, even if these are performed jointly by a single operating firm. A small amount of gas service can be retained with a principal electric system. Since the gas business of the American Water Works system was small relative to the electric service, the holding company was allowed to retain both businesses.[52] Setting up integrated systems, the SEC does not combine a principal electric business, for instance, with a large additional gas system. First the Columbia Gas & Electric Corporation and later several other holding companies were denied control of both gas and electric properties.[53] This problem, which raises questions about gas-electric competition, is discussed more extensively in the next chapter.

The One-area Rule. A one-area system is basic in integration policy. The SEC commonly approves additional integrated systems only when they are in the same state as the principal system, or when they are in adjacent states. This standard was first stated in 1941 as the commission dealt with the United Gas Improvement system.[54] According to the statement

> . . . a holding company may continue to control an integrated public-utility system or systems additional to the "single" integrated . . . system only if all such additional system or systems are located in the same State or States in which the "single" system is located, or in States adjoining thereto.

Congress did not write the one-area standard into the Holding Company Act, but the legislative history of the act showed that Congress preferred such a standard.[55] And the objectives of interconnected systems and localized management, too, dictated the choice.

The one-area rule was the main reason for the North American case in which the Supreme Court upheld the integration provisions of the Holding Company Act. Even before the law was fully tested in the courts, some holding companies, such as the Standard Power and Light organization, accepted a single-area relationship between the principal and additional systems.[56] But the North American Company, controlling eighty companies that operated in seventeen states and the District of Columbia, strongly resisted the enforcement of this integration standard.[57] It wished to retain control of electric properties in Wisconsin, Missouri, and Cleveland. Denied its own choice of a system, the company refused to make a further selection; then the SEC picked a single-area system that was centered in St. Louis. Deciding this case, the Supreme Court did not accept the arguments of the company against federal control of security ownership or the "vast destruction of values." As it approved the integration provisions of the law and upheld the action of the commission, the Court said,

> Congress has concluded from the extensive studies made prior to the passage of the Act that the economic advantages of a holding company at the top of

an unintegrated, sprawling system are not commensurate with the resulting economic disadvantages. The reasonableness of that conclusion is one for Congress to determine.[58]

The one-area rule is a locational standard of integration. An integrated system also must have an economical, technical relationship between the principal and additional systems. An additional system cannot be controlled by a holding company merely because it is in a state that adjoins the location of the principal system. A borderline case concerned several subsidiaries of the Middle West system—part of the old Insull organization. The Central and South West Utilities Company, a holding company which later ceased to be a subsidiary of the Middle West Corporation, wanted to retain control of five Southwestern electric companies. These companies operated primarily in Texas and Oklahoma, and thereby met the one-area requirement. Transmission lines connected the companies, and electricity was interchanged. At first the SEC decided that the properties consisted of two integrated systems; [59] later the commission, seeing more technical evidence of interconnection, allowed retention of the five operating systems.[60] Nor can a holding company control the principal and additional systems just because they are located in the same state. The Lone Star Gas Corporation, for example, was forced to dispose of some gas properties that were located, like the principal system, in Texas.[61] An interconnected system of gas production, transmission, and distribution properties was located in northern Texas. In addition the corporation had gas distribution properties in El Paso and Galveston. When an integrated system was chosen, these isolated distribution properties were not included. An integrated system has technical dimensions, which are measured by operating and managerial connections as well as locational dimensions.

Physical interconnections of electric properties, which usually consist of transmission lines and jointly used generating stations, are important facts of integration decisions. The SEC examines the current interconnections, and studies the possibilities of future technical connections. Plans for generating plants and transmission lines are considered, but the commission does not take account of uncertain construction plans. It disregards plant changes ". . . which might occur in the remote future, and whose occurrence has not been foreshadowed by any facts shown in the record." [62] Trying to save their financial controls, holding companies cannot talk about an indefinite or imaginary integration; they must show real facts or real plans of coordinated systems.

Size of Systems. Size is another dimension of an integrated system. When a principal system alone or principal and additional systems together are chosen, the SEC examines the expanse and magnitude of the utility operations. Large, extensive organizations are likely to be broken up. This view is illustrated in a decision about the Cities Service system. An integrated system of Rocky Mountain properties, extending from northern Wyoming to New Mexico and Arizona, was proposed. The SEC rejected the proposal, saying that it did not meet the standard of localized management. If holding companies were allowed liberal interpretations of integrated systems, there would be ". . . hegemonies of holding-company control so vast that the Act would permit a few holding companies to divide the country."[63] One fact is evident: the market control of an integrated system is limited so that the managers are close to the consumers, and earnings and price regulation can be easily administered. Yet the commission apparently does not wish to forbid technical economies of large-scale operations. For instance, an interconnected system of natural gas production, transmission, and distribution properties, which are spread through six states, is kept together.[64] And the American Gas and Electric Company, a subholding company in the old Electric Bond & Share organization, is allowed to control interconnected properties that are spread through seven states—Virginia, West Virginia, Kentucky, Tennessee, Ohio, Indiana, and Michigan.[65] This system, the SEC believes, approaches the maximum size that is consistent with localized management, efficient operation, and effective regulation.

"Other Businesses." As the SEC administered Section 11 of the Holding Company Act, it was concerned primarily with integrated electric systems and integrated gas systems. That was the legislative focus in the Holding Company Act. Yet the holding-company organizations often contained more than gas and electric properties. They had other utility properties such as steam railroads, street railways, bus lines, or water systems; and they held the property or securities of oil, coal, ice, manufacturing, real estate, and other nonutility businesses. Taking account of these mixed holdings, Congress said that the other businesses could be retained as long as they were ". . . reasonably incidental, or economically necessary or appropriate to the operation of . . . [an] integrated public-utility system. . . ." These businesses could be retained if the commission found them ". . . appropriate in the public interest or for the protection of investors or consumers and not detrimental to the proper functioning . . ." of integrated systems.

The SEC made, for the most part, a strict interpretation of the conditions under which "other businesses" could be included with an integrated electric or gas system.[66] As a general rule, the commission opposed the retention of these other businesses unless they were small relative to the principal business. Nor did the commission approve inclusion of the businesses only because they had been parts of a corporate system for a long time. To keep a significant business other than electric or gas service, a holding company was expected to show a functional relationship between the principal business and other business. The company was expected to show how operating economies, such as those of personnel, could be realized. But an extra business was not "economically necessary" merely because it was profitable. The commission wanted joint economies between the operations. Thus the other business was supposed to bear either an incidental relationship or a coordinate and economical relationship to the integrated utility system.*

Some utility businesses, other than electric and gas operations, were retained. Because some plants are used jointly to produce steam and electricity, the steam heating businesses of electric companies commonly were treated as "economically necessary" businesses. Likewise, a railroad was retainable when it was used to transport coal to an electric generating plant.[68] On the other hand, the commission did not include water works and telephone plants in the integrated systems. And the commission often excluded street railway and bus systems, even though the street railways obtained electricity from the integrated electric system.[69] A pure electric or gas system was preferred.†

Some nonutility businesses could be retained; others were eliminated. When coal mines, for example, provided an economical source of fuel, they were treated as necessary parts of an integrated system; otherwise they were considered general investments and were excluded. Ice manufacturing properties, in which some holding companies once made sizable investments, also were excluded. And real estate ventures, bridge companies, and manufacturing enterprises were eliminated. The oil business often had a close connection, however, with an integrated natural gas system. Drilling for gas, a company often struck oil or obtained an oil-gas well. Gas and oil were joint products. The Lone Star system was allowed to retain its natural gasoline plants and oil business, because these operations were subordinate to and conjoined with natural gas production.[71] But the Cities Service system, which produced, refined, transmitted, and marketed oil and oil products in forty-five states, was forced to choose between oil business and public utility business; it decided to be a nonutility holding company.[72] The oil business of the Cities Service system was so vast, so complex, so clearly separate from electric or gas utility service that it could be economically operated as a single enterprise.

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* When a subsidiary system could not be included in a one-area, integrated system, some holding companies wished to include the system as "other business." They desired to count the subsidiary investments as "other" investments; they wished to use the other-business condition as a protection against dismemberment. These proposals were rejected by the commission.[67]

† A federal court did not approve the exclusion of urban transportation properties in the Engineers Public Service system. According to the court, Congress approved the retention of other businesses that served the ". . . interests of the general public or those of investors or consumers, irrespective of the functional relationship between the businesses and the principal system."[70]

Divestments. Simplifying their corporate structures and integrating their operating properties, holding-company systems were forced to sell, exchange, or distribute securities and properties. Divestments of securities and operating properties were the means by which integrated systems were created. To achieve the end of integration, ownership and managerial changes for about $9,000,000,000 worth of operating properties were necessary.[73] When the SEC issued integration orders under Section 11, disposition of properties or subsidiary securities also were ordered. The commission allowed abundant but not unlimited time for the divestments.[74] No divestment method was specified. The companies searched for buyers, worked out security exchanges with other systems, or arranged some other dispositions of the assets.[75]

The portfolios of holding-company investments, consisting of the voting stocks as well as preferred stocks and debt securities, frequently were sold. Sometimes the subsidiary securities were sold to other holding companies. Buying the securities of adjacent firms, holding companies could broaden the scale of their operations and still meet the one-area, technical standards of an integrated system.[76] For instance, the Virginia Electric Power Company, a subsidiary in the Engineers Public Service system, bought the voting stocks of an adjacent electric-gas firm that the Associated Gas and Electric system was forced to dispose of.[77] This company was added to the principal system that the SEC chose for Engineers Public Service; the commission approved the acquisition because it was the ". . . initial step . . . toward the efficient and economical development of an integrated public-utility system." [78]

Holding companies also sold the securities of subsidiaries to individuals who planned to manage the operating systems. A few operating companies bought their own securities from parent companies.[79] Several holding companies made open, public sales of the securities that they held. These public sales commonly were handled like the sales of new security issues: brokers bid competitively for the securities and sold them to the public.[80] The commission was insistent on competitive bidding.[81] Sometimes the holding company organized a new company, transferred security holdings to the new firm, and then sold the new-company securities to the public.[82] After some of the investments had been sold, the cash was used to buy other securities and operating properties, or to pay off debts and to retire preferred stocks.

The stocks of subsidiary companies also could be distributed among the investors of holding companies. Simplifying its capital structure, the

United Corporation, for example, exchanged portfolio securities (the voting stocks of subsidiary companies) for its own preferred stocks that were outstanding.[83] To meet divestment requirements, other holding companies sometimes declared dividends of subsidiary stocks; the voting stocks of subsidiaries were prorated among the stockholders of the holding company. This was the way in which the North American Company disposed of its Detroit Edison stocks,[84] and Commonwealth & Southern Corporation divested its security holdings of several Northern subsidiaries.[85]

Sales of operating plants were common. Small properties sometimes were sold to their local managers,[86] others being sold to unaffiliated persons, or to operating companies with which the properties could be easily coordinated. But the most notable change was the sale of properties to governments and cooperatives.[87] Municipalities acquired water, gas, and electric systems. Rural cooperatives and public utility districts, the Washington and Oregon counterparts of rural electric cooperatives, bought many electric distribution or generating systems. Even the large public-power systems—e.g., the TVA, the Lower Colorado River Authority, and the public system in Nebraska—acquired large private plants. The Consumers Public Power District in Nebraska, a public agency which produces and distributes electricity throughout Nebraska, bought most of its properties from holding companies that were breaking up. Giving the municipal, cooperative, and regional power systems opportunities to buy distribution systems, the integration requirement was a great boon to public electric service. The public systems acquired markets that otherwise were closed to them.

Although the SEC did not prescribe specific divestment methods, it did regulate the divestments. When a holding company distributed portfolio stocks among its security holders, the commission watched the allocation just as it watched security allocations in any general liquidation or reorganization case. If holding-company investments were sold to the public through a broker, the selling prices and the selling costs (the bankers' charges) were investigated. The fees and expenses of divestment plans, too, were examined.[88] And when physical properties or securities were sold to private or public buyers, the commission studied the price and integration characteristics of the exchanges. Both the prospective earnings [89] and the costs [90] of the properties or securities were considered.* But the prices, controlled commonly by competitive bidding, were not firmly fixed at the original costs of the properties; exchanges were approved for more or less than the original costs or book costs of the assets.[92] The SEC usually was willing to approve arm's-length transactions.[93] It did wish to be sure, however, that the exchanged property could be integrated with the buyer's system.[94]

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* Some of the acquisitions were not subject to SEC control, because the acquiring company was not a subsidiary of an electric or gas holding company.[91] In these cases the SEC did not restrict the selling prices of property divestments; the commission was interested in the security holders of the divesting company rather than the consumer prices of the acquiring firm.

Revisions of Capitalizations. The Holding Company Act requires several kinds of corporate revisions. Great-grandfather companies and unnecessary holding companies are dissolved. And holding companies can control only integrated systems, and are forced to dispose of their other holdings. These revisions are discussed in preceding sections. Another corporate revision remains: holding companies can be forced through a recapitalization process. They can be forced to reorganize their capital structures, and to redistribute their voting rights. Obeying the Holding Company Act, the SEC examines the capital structures of holding companies and studies the need for simpler capital structures and voting power changes. The commission is expected to take steps to ". . . ensure that the corporate structure or continued existence of any company . . . does not unduly or unnecessarily complicate the structure, or unfairly or inequitably distribute voting power among security holders. . . ." Even if a holding company is solvent and controls an integrated system, it still can be subjected to a financial reorganization—to a revision of voting rights, capital structure, and capitalization.

The SEC makes use of the recapitalization controls. This regulation has several purposes. First, excessive capitalizations are scaled down. Next, the commission simplifies capital structures, eliminating debt securities and preferred stocks. When holding companies do not have fixed-return securities, they cannot be troubled again by interest charges and large arrearages of preferred stock dividends. And the pyramiding of capital structures is erased. Third, the commission redistributes the voting rights among security holders; it reduces the control of common stockholders who have small investments in a company. Unless holding companies voluntarily offer reorganization plans,[95] the commission can order the recapitalizations.[96]

The Commonwealth & Southern Corporation, an important holding company whose subsidiaries were located mainly in the old South, was one firm that was forced through a financial reorganization.[97] This holding company lacked a simple capital structure, and the voting rights were inequitably distributed among the security holders. Common stocks of subsidiaries made up most of the assets of the company. Yet the capital structure consisted of more than common stocks; a relatively small bank loan and a large amount of preferred stock, as well as much common stock, were outstanding.* This structure clearly showed evidence of pyramiding. And voting rights were unevenly distributed. Even after unpaid preferred dividends began to accumulate and preferred stockholders thereby received voting rights, the common stockholders still managed the system. Yet the value of the company's common stocks was only 2.8 per cent of the total value of the operating properties. Seeing these facts, the SEC ordered a recapitalization of the company.

Like a reorganization of an insolvent company, a financial revision under Section 11 has three main dimensions: the total capitalization, the composition of the capital structure, and proration of the new securities to the old security holders. The new capitalization is the most important fact of the reorganization. This capitalization not only fixes the future financial obligations, but also determines how many new securities can be allocated to the old bondholders and stockholders. Computing the total capitalization of a public utility organization, the SEC is guided by the prospective earnings, not by the old debt and stock obligations.[99] The earnings history of the organization is summed up. Yet the commission is interested primarily in the future earnings that will be used to support the new capitalization; the past earnings may show the general trend of earnings, but they are not conclusive evidence of the future earnings. And when a holding company is recapitalized, the commission naturally extends the earnings studies and predictions to the subsidiary companies.

Common-stock structures are basic characteristics of recapitalized holding companies. When these companies are recapitalized, no debt securities or preferred stocks are issued.† This policy eliminates the pyramiding in holding-company structures. Financiers now cannot hold the common stocks of subsidiary companies, sell preferred stocks or even debt securities to the public, and thereby pyramid their earnings and managerial control. Since holding companies own mainly the common stocks of operating firms, they must issue the same kind of securities. Restricting holding companies to common-stock issues, the SEC also erases the need for more than one holding company in a corporate system. The holding company becomes simply a financial instrument for consolidated management of operating firms. Next, the problem of voting rights is solved. Since only voting shares of common stock are issued, there are no further questions about inequitable distributions of voting powers.

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* Other holding companies often had even more complex capital structures. The Federal Water Service Corporation, for instance, had a structure that consisted of debenture bonds, four different series of preferred stocks, and two classes of common stocks.[98]

† A common-stock structure is the general rule, but it is not an inflexible rule. Because the subsidiaries of the New England Power Association, for instance, had no bond issues or only small amounts of senior securities, the holding company was allowed to issue both bonds and common stocks.[100]

The SEC does not use exactly the same recapitalization policy for holding and operating companies.[101] Since the operating companies are regulated by state commissions, the SEC usually does not force recapitalizations on them.* Yet, when an operating firm is insolvent or must be reorganized before geographic integration can take place, the commission supervises the changes. These companies are allowed to issue mortgage bonds, though the SEC wants to avoid such large amounts of debt that further borrowing is restricted and voting powers are badly distributed. Preferred stock issues are limited or eliminated; the commission prefers a simple capital structure that consists of one issue of mortgage bonds and one kind of common stock. Because the reorganized operating companies issue both bonds and common stocks, the total capitalizations are important. Again the capitalizations are controlled by earnings prospects—by temperate earnings anticipations rather than the high earnings of war periods or prosperity years.

Allocations of new securities to old security holders are handled as they are in any financial reorganization. Again the rule of absolute priorities is used. Claims of security holders are ranked, and each class of securities is paid off in new securities until the new capitalization is fully distributed.† This allocation procedure makes the total capitalization an important fact. If the common stockholders receive new securities, the total capitalization must be large enough to cover more than the prior claims. If the reorganized company is greatly overcapitalized and the old stocks do not have any value, the old stockholders do not get a part of the new securities.[104] Yet the common stockholders often get some of the new securities. Even when large arrearages of preferred dividends must be paid, the commission still may see future prospects for dividends on the old common stocks. Determining the total capitalization of a reorganized company, the SEC values the property as if a going business instead of a liquidation is under consideration.[105] And the Supreme Court supports this view.[106]

Some Effects. The Holding Company Act of 1935 is a stringent law. And the SEC is a vigorous administrator of it. Breaking up holding company systems and forcing financial reorganizations on the remaining holding companies, the SEC is an uncommonly powerful regulator.

* The SEC is authorized to order recapitalizations of operating companies only when the voting rights are unfairly distributed. "Except for the purpose of . . . equitably distributing power . . .," the commission cannot ". . . require any change in the corporate structure or existence of any company which is not a holding company, or . . . whose principal business is that of a public-utility company." [102]

† The SEC also follows the decision of the Supreme Court in the Deep Rock case.[103] In this case the subsidiary of a holding company was in receivership, and owed an open-account debt to the holding company. The Court, considering the corporate affiliation of the companies, decided that the open-account debt was subordinate to the preferred stockholders' claim.

American governments, functioning in an environment where the tradition of private enterprise still is strong, rarely liquidate or reorganize an established industry. The prohibition amendment destroyed investment values in the liquor industry, and antitrust legislation forced financial and marketing reorganizations in a few industries. But no other legislation ever equaled the Holding Company Act in bringing about broad managerial and financial changes. No law ever forced the divestment of about $9,000,000,000 worth of property.[107] Because Congress saw uncommonly bad practices by holding-company financiers, it was provoked to pass extraordinary legislation. Congress dealt bluntly with irresponsible, notably acquisitive conduct, preferring to rebuild the corporate structures rather than to temper the practices.

Nearly all the holding-company systems were subjected to some kind of financial reorganization. Not only great-grandfather companies, but also unnecessary holding companies were eliminated. Moreover, debt securities and preferred stocks were taken out of their capital structures. These financial changes simplified the corporate organizations. As a consequence of the changes, some systems were perhaps able to borrow investable funds and to make investments that were deferred for a long time. If straitened financial conditions, such as large amounts of unpaid preferred dividends, limited the borrowing capacity of a company, a recapitalization obviously facilitated new investments and service expansion. Alteration of top-heavy capital structures also improved borrowing conditions. Yet the regulatory work of the SEC did not open up large new opportunities for public utility investments. The demand for electric and gas service, the costs of equipment, wage rates, raw material prices, and taxes—these revenue and cost conditions of investment decisions were not altered by the holding-company regulation. The basic investment situations were on the operating-company level rather than the holding-company level.

Scaling down the size of corporate systems and striving for more localized management, the SEC brought the company managers closer to the consumers and state regulators. Earnings and price regulation could be more effectively applied to operating systems; the prices for service could be lower. But regulation by state commissions did not improve merely because some holding companies were eliminated, others were recapitalized, and integrated utility systems were created. At any rate, the holding companies were not the main hindrance of intelligent, continuous earnings regulation. If the typical commissioner looked reflectively into utility regulation, he could see that he was the main hindrance. He often lacked knowledge, experience, vigor, and funds. To realize lower consumer prices in conjunction with holding-company regulation, the state commissions, too, needed reorganization or integration.

Geographical and technical integration was a significant accomplishment. Creating one-area, interconnected electric and natural gas systems throughout the country the SEC accomplished something that seemed impossible or impracticable before 1935. Holding-company control was adjusted to technical and cost conditions rather than financial and market domination standards. Yet it was imperfect integration. Judged by its decisions, the SEC looked at the physical and geographic relations of operating properties. Were they tied together; did they make use of the operating relationship; were they adjacent to each other; was the integrated system small enough for localized management to be assured? Such were the questions the SEC asked itself as it chose the principal and additional integrated systems.

Emphasizing physical and geographic conditions, the SEC did not make careful cost studies as integrated operating systems were chosen. The most economical combinations of operating properties were not prescribed. Perhaps some systems represented the most economical units; others probably were smaller or larger than the economic optimums.[108] The SEC could not be expected to make perfect choices. Careful cost studies took much time, were expensive, and were possible sources of extensive litigation. An optimum choice under current technical conditions could be upset by future technical changes. And a thorough integration necessitated a break-up of operating systems—a reshuffling of generating plants, transmission lines, and distribution systems in the electric industry. The SEC brought integration down to the level of the state commission. If operating properties, too, were carefully integrated, the state commissions were the proper authorities for the job. Neither the state legislatures nor state commissions showed any interest, however, in a reorganization of operating plants and marketing areas.

Chapter 9

Control of Competition

WHEN REGULATION of public utility companies started in the last quarter of the nineteenth century and the first decade of the twentieth century, the American people and their legislators still had a strong faith in competition as the primary means of price control. Since they relied on competition to control the prices and the output of numerous commodities, consumers and lawmakers thought that competition was one way to regulate utility prices and service standards. A policy of competitive control was treated as an alternative to government regulation. At first the local governments allowed more than one firm to occupy the public utility markets, and counted on the rivalry of the companies to control prices and the quality of service. But reliance on competition as a general way of control was abandoned eventually. Now the state and federal commissions, using whatever powers the legislators and courts give them, try to fix the standards of pricing and service production. Guided by the natural monopoly rationale, these regulators customarily give each utility company exclusive control of a market. Public control of a firm is preferred to the limited rivalry of a few companies.*

Competition between the same kind of companies is not the only public utility competition, though it is the sort to which regulators give most attention. Another kind is interutility rivalry, the rivalry of companies that perform dissimilar utility services. Gas and electric companies, for instance, compete with each other for certain kinds of sales. They are rivals for refrigeration, domestic cooking, and some industrial heating sales. Their advertising clearly shows evidence of rivalry. Emphasizing the twentieth century wonders of their service, electric companies direct their salesmanship to persons who are using or can use gas service, while gas companies, advertising the economy of gas service for domestic cooking, water heating, and refrigeration, try to offset the aggressive selling policies of the electric firms. As another example of interutility rivalry the Bell system and Western Union compete with each other for rapid, intercity communication business. A third kind of competition is the rivalry of utility companies with nonutility firms or industries. Street railway or bus companies feel this kind of rivalry from the private automobiles or the unregulated taxis. And the gas and electric systems, particularly the former, often adjust their prices to the prices of coal and fuel oil.

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* Here, as in Chap. 2, the term "competition" is used in the sense of a rivalry of sellers, each of whom seeks to maximize his net revenue.[1] For utility industries this is not, of course, the rivalry of numerous sellers; it is not pure or perfect competition. Since technical conditions of utility operations restrict the number of sellers in any market, only two or a few utility firms can be rivals of each other.

THE RIVALRY OF LIKE COMPANIES

Commissions commonly control the number of utility firms and their market areas. In this connection the commissions issue what are called "certificates of convenience and necessity." When a company wishes to operate as a public utility, it must obtain a certificate of convenience and necessity from the commission that controls the market area. Or when a firm wants to expand its operations into a new geographic area (e.g., into another town or an unserved rural area), it must get another certificate. For commission regulation the certificate is the counterpart of the franchise that is issued by a local government; in some states, in fact, a utility company must obtain both a certificate and a franchise.[2] Like a franchise, the certificate is used to limit the number of firms that serve each market. Unlike a franchise, it usually does not have a specific expiration date. Possessing a certificate of convenience and necessity, an existing company is not assured exclusive control of a market. At one time a commission may restrict the issuance of certificates, choosing the firm that promises the best service and the lowest rates. At another time additional companies may be allowed to duplicate the service that the original company produces. The meaning, then, of the "public convenience and necessity" rarely is stated explicitly by commissions; the issuance of certificates commonly is subject to judgments of commissions as the cases are decided.[3]

Permitting Duplication. Since they generally are free to issue certificates as they please, commissions have sufficient power to control the rivalry of like kinds of utility companies. Taking one choice, they may issue certificates to all who seek them. They can invite competition of utility firms, and rely on rivalry to control prices, service standards, and other matters of utility-company conduct.[4] This is the rivalry of two firms or no more than a few firms; it is a limited rivalry that can scarcely resemble the pricing and production effects of many sellers who operate in an environment of pure competition.

In economic reasoning the unrestrained issuance of certificates, which allows more than one seller to occupy a market, creates duopolies and oligopolies in public utility markets. When only two companies occupy a market, a duopoly situation exists; when a few sellers operate in a single market, there is an oligopoly situation. If only two, or no more than a few companies occupy a market, the earnings, outputs, and prices of the sellers are affected by the nature of the commodity, the dependent or independent attitude of the rivals toward each other, the market knowledge of each seller, and many other variable factors. A case of two firms that sell the same commodity is the classic case of a duopoly. A number of solutions, which often are based on unreal assumptions about cost curves and about the conduct that each seller expects from his rival, are worked out by economists.[5] Sometimes the economists, who prefer a deductive and mechanical analysis, assume that the two rival sellers do not arrange price or production agreements, or reach any sort of mutual understanding. Yet as Chamberlin observes, two sellers are bound to be aware of each other's conduct.[6] In our society one seller usually does not believe that his price reductions can escape the attention or will be ignored by his only rival. But there is no way to predict the actual reactions of rival sellers under all conditions. Since business managers are human beings who have dissimilar backgrounds, temperaments, and knowledge, economists can scarcely find a realistic standard for all reactions of competing duopolists or oligopolists. And, as a further fact, two utility firms are not identical even if both of them are selling electricity or some other service. They have obvious differences in management, financial resources, technical conditions of operation, market limits, and anticipations of regulatory action. There is no determinate solution for this sort of public utility competition.

The free issuance of certificates of convenience and necessity can lead to several possible market situations. One of these is the cutthroat or destructive competition that is discussed in Chapter 2. One seller reduces his prices to hold his customers, to increase his sales, or to drive his rivals from the field; the rival sellers retaliate; prices decrease until one or more of the rivals cannot survive. This result of utility-company rivalry is illustrated by a price war between two Montana gas companies.[7] The Great Northern Utilities Company met the challenge of the Citizens Gas Company in a determined, cutthroat manner. Retaliatory rate reductions were made by these companies until the natural gas rate decreased to 15 cents a thousand cubic feet. Yet the leader in the price competition, the Great Northern Company, still served fewer consumers than the other system. When the price decreased to 15 cents for a thousand cubic feet, the Citizens Company asked the Montana Commission to stop the price competition; the commission ordered the Great Northern Company to increase its prices to the level of those of the Citizens Company. The Montana Commission sought to avoid a fight to a finish between the firms. And the U. S. Supreme Court, cognizant of a possible impairment of utility service, did not find that the commission's regulation of minimum rates was an "infringement of any constitutional right." [8]

Another result of plant duplication is unification or holding-company control of the rival companies. Like the buyers who wish immediate price reductions and do not consider the ultimate effects of low prices, commissioners may think that the prospect of lower rates is enough to justify the issuance of duplicating certificates. At first the price reductions seem to justify the competitive policy. Yet as the competitive struggle progresses, the rival companies see the business folly of their competition, and agree on a corporate consolidation. Or common corporate control of the rival companies can be effected; the stockholders of one company sell their voting shares to the rival company or its stockholders. Then the new, consolidated firm or the affiliated companies revise the service standards, and request an increase in rates. And the buyers, who desire lower prices and generous service policies, are dismayed and angry.[9]

The eventual merger of rival companies is demonstrated in another Montana case. After having engaged in a short-lived rivalry, two Montana gas companies were merged and the surviving firm asked for higher prices.[10] The two companies set out to build duplicate natural gas lines and to acquire markets in the same two towns. ". . . Neither the inclemencies of the winter season nor the darkness arrested their efforts . . ." to complete the lines. Each company began to serve all the customers that it could obtain at a price of 15 cents a thousand cubic feet of gas. Customer lines were installed free of charge; no price was charged for the installation of furnaces and ranges; and when the gas supply was low, coal was given to customers. Offered a low-priced and attractive service, nearly every family and business house in the two towns consumed natural gas. After the rivalry lasted for slightly more than a year, the two firms were merged. As the unhappy buyers might have anticipated, the new company asked immediately for a large increase in rates. Since the commission wished to preserve natural gas service in the towns, it allowed the company to charge higher rates.

Issuance of duplicate certificates can have another kind of effect: the rival companies can ignore the opportunities to compete. Two or more utility companies can avoid the aggressive price and service rivalry that the buyers expect of them. Although some overlappings occur at the market edges, each firm can develop its own market area. Nullifying the competitive threat to each other, the several rival firms can agree, formally or informally, to share a market—to fix the boundaries of their separate markets. The rivalry of utility companies also is limited because investors often are not attracted to new, duplicate plants. They are fearful of price wars and do not like the threat of competition and the uncertainty of future earnings. Consequently the investors are not likely to risk a sizable investment in a market that already seems to be preempted by an established company. Utility firms rarely try to expand into occupied markets. The conservative managers of successful companies do not seem to enjoy aggressive price competition; they apparently prefer a quiet business life within an exclusive market area. Investors and managers of utility companies can afford to act the part of business gentlemen, accepting "ordinary" profits and ignoring opportunities to increase their profits at the expense of other firms.

Exclusive Certificates. Choosing another and more common policy of market control, commissions grant only one certificate for each market area. Except for radio broadcasting, utility services usually are performed by a single company in each community. Neither the commissions nor the companies favor the issuance of more than one certificate of convenience and necessity for each market. State and federal commissions do not issue exclusive certificates, just as local governments commonly do not grant exclusive franchises. Commissions can issue more than one certificate for each area. But they rarely do it. When a firm asked permission to sell natural gas to industrial buyers, the Pennsylvania Commission preferred the service of established companies that served both domestic and industrial buyers.[11] It preferred to rely on the existing companies, even though the new firm promised lower rates for industrial buyers. And the Wisconsin Commission supported this policy even when a cooperative company, organized by buyers who no longer desired service from a private system, wanted a certificate of convenience and necessity.[12]

Again the point should be made that buyers as well as investors can lose something as a result of utility plant duplication. When several companies are allowed to occupy a single market, they eventually can consolidate or avoid aggressive rivalry in some manner. Even if they engage in a fight to the finish, the benefits of the buyers are likely to be temporary. As soon as one company collaborates with its rival, is absorbed by the rival, or becomes a corporate affiliate of its adversary, the buyers usually can count on higher prices and less frequent service innovations. A considerable investment can be wasted in duplicate plants; and some of these unnecessary investment costs of service may be charged to the buyers.

Commissions commonly believe that better service can be obtained from a single firm. When only one company occupies each service area, there is no chance of service impairment as a consequence of a price war. And the single firm is more efficient than several independent companies in integrating the service needs of the buyers. Urban transportation schedules can be arranged for a whole city; interruptions of gas and electric service are less common when buyers are served from several interconnected plants instead of several separate plants; the responsibility for fire protection can be easily affixed to a single water company; and a single telephone system provides city-wide service for each customer. Justice Brandeis, writing the minority opinion of the New State Ice case, said, "The introduction in the United States of the certificate of public convenience and necessity marked the growing conviction that under certain circumstances free competition might be harmful to the community. . . ."[13]

A market often can be served most economically by a single company. Given a large market area for its development, a single system usually can realize technical economies of large-scale production more readily than several rival firms. Likewise, a large company usually realizes more diversification economies than several small firms. A large urban transportation company, for example, usually has a better opportunity than a small transportation company to pool and to shift the use of its equipment, as the demands of consumers change during a single day. The cost of capital usually is lower, furthermore, when there is no competition. Merely a threat of competition sometimes is enough to increase the cost of borrowing as long as investors, conditioned by past experiences, are fearful of price wars and the costs of plant duplication. And the absence of rivalry permits a firm to take a longer view of plant investments—to look far ahead as investments are made in technological changes and as plans are formulated for market expansion. Having exclusive control of a market, a company is not disturbed by the day-to-day chances of conflict with its rival or rivals. Seeing an opportunity for more earnings, the company can improve the service or make voluntary price reductions. If an increase in demand is anticipated, it can provide extra plant capacity ahead of the demand change without any thought that other firms can take up the increase in demand.

Avoidance of rivalry between like kinds of utility firms is consistent with the existing pattern of earnings, price, and service control. Commissions are expected to take excess earnings away from companies, to fix the prices that are paid by consumers, and to prescribe reasonable service standards. If the commissions depend on a limited amount of rivalry to control earnings and prices, they forsake their traditional administrative functions. As long as regulators exercise earnings and price control of utility firms, the issuance of certificates also gives them opportunities to select the most efficient utility firms. If two or more companies seek certificates, the one with the lowest anticipated prices for service,[14] the lowest cost of capital, the best financial resources, and the greater experience in utility operations can be chosen.[15] Having some responsibility for the earnings of utility firms, commissioners can go further and deny any certificate unless there are clearly good chances of financial success. For instance, when a company asks for a certificate to construct a natural gas transmission line, the Federal Power Commission seeks information concerning the investment conditions that face the applicant: the adequacy of gas reserves, the prospective demand for service, the prospective operating expenses and construction costs, the sources of investment funds, and the probable arrangement of the total capitalization and capital structure.[16] An alert commission selects not only the most efficient firm, but also the firm that is most likely to be free from financial troubles.

Occasional Duplication. Avoidance of plant duplication is the common rule of commissions. But it is not the universal rule. Under certain conditions the commissions grant duplicating certificates. A distinction apparently is made between the rivalry of two private plants and that of a public plant and a private plant. Although state commissioners often are not strong protagonists of public production of utility services, they commonly allow municipally owned electric plants in markets that are occupied already by private systems. Similarly, state commissioners generally grant certificates of convenience and necessity to the rural electric cooperatives that are sponsored and financed by the Rural Electrification Administration. They allow cooperatives to serve farming areas that are within the market areas of private company service, but are not yet served by the private firms.[17] State commissions generally consider the expansion of rural electric service more important than the possible rivalry between cooperatives and private companies.

Another reason for duplication is the inefficiency of the existing firm. Commissions naturally want efficient managers and efficient utility plants, even if they rarely study production methods as a means to determining the most efficient production. Commissions do not carefully study and then rigidly prescribe efficient standards of plant operations. Nor are they anxious to resort to competition as a means of forcing service improvements. But at times the issuance of additional certificates or the threat of additional certificates seems to be the only way to realize service expansion, installation of technical changes, or better management. When a Wisconsin electric company made unwise plant investments and obtained a reasonable return on the investments only by charging high prices, the commission gave a duplicating certificate to a municipal plant.[18] After it was established, the California Commission always held a general threat of competition over utility companies. If a California company operates inefficiently or attempts to dodge regulation, the commission uses the threat of competition to force improvements of operation and service.[19] The commission does not favor duplication of utility plants; [20] yet it does believe that the possibility of competition is necessary to realize some kinds of service improvements. Lacking specific authority to order new investments in utility plant, the commission can propose the issuance of more certificates so that the established company is encouraged to invest in improvements, to act the part of a quasi-public enterprise, and to respect regulatory authority.

Some commissions issue duplicating certificates in an effort to lower prices, or because they cannot regulate the established company effectively. In Arkansas a natural gas company was allowed to serve industrial buyers in a market that was occupied by another gas company.[21] The new firm offered to sell gas at a price that was only two-thirds as high as that of the established company. Similarly, when a natural gas company wanted to sell low-priced gas to industrial consumers, the New York Commission gave it a certificate despite the protests of the established manufactured gas system.[22] In several instances state commissions gave certificates to a second company when the original company persistently tried to evade regulation. This apparently was the reason why the Kansas and Missouri Commissions allowed more than one natural gas company in several markets; they were troubled by the opposition of Cities Service firms to earnings and price regulation.[23] Likewise, the New York Commission, growing weary of litigation with a private company about a service extension, allowed another firm to make the extension.[24]

INTERUTILITY RIVALRY

Even if a utility company has an exclusive market for its commodity, it often encounters some rivalry from firms that sell another kind of utility service. When some buyers are willing to substitute one utility service for another, there is a condition of interutility competition. All utility services are not substitutable for each other. Water service, for instance, is not an alternative for urban transportation service. Nor is any utility service a perfect substitute for another. Yet, even if they are imperfect substitutes, buyers do make real choices between some kinds of utility service. Telegraph service and the long-lines service of AT&T, for example, are alternative choices of many consumers.* Some persons consciously consider the alternatives of telephone and telegraph service many times in a year. When they do, they must weigh the higher cost of long-distance telephone service against the speed and the close personal contact of the service. For short distances people are likely to make toll calls rather than send telegrams, because the price difference is small. But as the communication distance and the price differential increase, persons often prefer telegraph service unless they have high incomes and can be indifferent to the extra cost of telephone service, or must communicate immediately with other persons.

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*When a written record of a communication is required or when the parties cannot be brought together simultaneously, a toll call is not substitutable for a telegram. And when an immediate, personal contact is desired, a telegram is not substitutable for a toll call.

Telephone and Telegraph Prices. Being rivals for intercity communication customers, AT&T and Western Union must take account of the price, speed, and product differentiation of each other's services. When either the Bell system or Western Union offers a new kind of service or a service improvement, the other system loses revenue unless it counterbalances the change with a lower price or a service improvement. A new kind of telegraph service or faster handling of telegrams affects the long-lines revenue of the Bell system, just as a reduction of line interference or more rapid connections give the telephone companies the advantage.* But additional product differentiation or technical improvement of, say, telephone service is not always followed at once by further product differentiation or improvement of telegraph service. Technical changes do not occur at the same time in the two industries. Seeing the effect of telephone innovations on its earnings, Western Union searches for innovations. Yet it does not always find them. A reduction of telegram prices may be the only way in which it can hold its customers as toll telephone service is improved.

The relationship of telephone and telegraph prices is particularly significant. If AT&T voluntarily revises the structure of long-distance telephone rates and lowers some prices, this is bound to affect the demand for telegraph service. When the price relation of telephone and telegraph service changes, the buyers' choices of the two services change. Facing a loss of revenue, Western Union can counter the telephone price change with a reduction of telegram rates. Since the prices of telephone and telegraph service are interdependent, neither AT&T nor Western Union probably plans a price change unless the reaction of the other is considered. But even though the reaction of each seller to his rival's price policy is the critical problem, the reaction cannot be clearly foretold. Neither the

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* The Bell system, which did not introduce transcontinental service until 1915, usually leads with the technical changes and voluntary price reductions. Backed by much research and many patents, the Bell system has many opportunities to effect cost economies, to reduce prices, and to introduce new kinds of service. A research subsidiary, Bell Telephone Laboratories Inc., and about 17,000 patents favor the growth of telephone business and handicap Western Union even if the Bell system still is a large storehouse of unused patents and technical knowledge.

Bell system nor Western Union knows precisely what the response of the other will be to any price change. Each company can recall the past reactions of his rival. Yet when one of the communication systems reduces its prices either with or without a warning to the other system, it may provoke an unfavorable reaction and lose revenue. There is no determinate solution of this pricing problem, unless the rival communication systems bind themselves to joint administration of prices.

Regulation of telephone and telegraph companies can disturb an established price relationship. When a commission reduces telephone rates because the earnings are excessive, it forces on Western Union either a compensatory rate reduction or a loss of earnings or both. Pressing down the prices of the most profitable service, regulators can force a contraction of the least profitable service.* That is what commission regulation has been doing to Western Union for several decades. The Communications Commission and state commissions, squeezing out the excessive earnings of toll telephone service, reduce the prices of telephone service. Western Union can reduce telegram rates and try to hold its business. Yet it may not have excessive earnings that can be used to absorb the revenue effect of the price reductions. Some of the revenue loss can be covered, perhaps, by reducing pay rolls, scaling down payments to railways for wire service, and closing some telegraph offices. In 1943 some economies were effected by the consolidation of Western Union and Postal Telegraph. After all the conceivable cost reductions of telegraph service are realized, commission reductions of telephone prices still can reduce Western Union earnings below a reasonable level. And Western Union, trying to survive, may be forced to contract its operations. Commission regulation can reduce the competition between the Bell system and Western Union.

Electric and Gas Competition. The competition of gas and electric companies started as soon as the electric industry began to develop. At first the electric companies began to take lighting customers away from the gas companies. When electricity replaced gas in the lighting of homes, buildings, and streets, the gas companies turned to the development of heating sales. For a time the rivalry between these utility industries subsided. Then electric companies, growing rapidly and searching for even larger markets, started to take heating customers away from the gas systems. The electric stove and electric water heater began to displace the gas stove and gas water heater. Even the industrial business of the gas industry was not safe, because the electric firms also sought industrial customers who wanted careful heat control. And both the electric and gas companies hoped to get a large share of the refrigeration business, though these sales, which developed after the First World War, went chiefly to the electric companies. Now the electric and gas companies are rivals for domestic cooking, refrigeration, water heating, and special kinds of industrial heating sales.

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* Telephone rates for long-distance calls decreased steadily after 1920; at first the reductions apparently were made largely by AT&T, but after 1935 the FCC effected important price changes. The average station-to-station rate (daytime calls) between the largest twenty-five cities was about $6 in 1920; in 1945 the average rate was less than $1.75.[25]

Like the case of telephone and telegraph rates, some electric and gas prices are interdependent. That is true because gas and electricity sometimes are substitutable for each other. When the price of either electricity or gas, particularly for domestic buyers, is reduced, the demand relationship of the two utility services can be disturbed. If the prices of residential electricity, for instance, are lowered voluntarily by the electric company or by the administrative action of a commission while the prices for a similar gas service do not change the sales of electricity can increase while the gas sales decrease. Such a shift in consumption depends, of course, on the response of the buyers to the price changes. Small changes of either the electricity or the gas prices may not affect consumption habits. But substantial decreases in electricity prices are likely to increase the number of electricity consumers, even though some of the new buyers must discard gas appliances and invest in electric appliances. Buyers do not shift from gas to electric service just as soon as substantial decreases are announced in electricity rates. They consider the attraction of electricity and the cost of electric appliances before they give up gas service and gas appliances to which they are attached. This is an indeterminate pricing problem. Yet, despite the indeterminacy of the price and demand relationships, the fact of real alternative choices between gas and electricity cannot be denied.

Interdependence of prices is less evident in the case of gas and electric service than for telephone and telegraph service. Buyers weigh their choices between telephone calls and telegrams more often than they consider the choices between gas and electric service. And the prices for the competing service are probably less important to the managers of electric and gas companies than to those of communications systems. Gas and electricity are not always substitutes for each other; they have special and independent uses. Although telegrams can be substituted for nearly all toll-telephone calls unless an immediate or personal communication is important, gas rarely is substituted for electricity in lighting, many household appliances, and industrial power uses. Gas companies, so far, are free from the rivalry of electric firms when they make space heating sales and most kinds of industrial heating sales. All the sources of revenue of electric and gas companies are not affected by the price changes and innovations of each other's service. Since each company has large undisturbed sources of revenue, it can ignore some changes in the prices of the rival company—even those for competing services. The revenue from the noncompetitive business cushions the effect of competitive pricing, and allows a company to be indifferent to the rival's price changes. In part this indifference to all price changes depends on the amount of the company's earnings. A prospering concern, earning more than an alert commission should allow, can afford to ignore some reductions of its revenue. When a company, on the other hand, is straining to avoid a financial reorganization, it needs to hold its customers and is likely to reduce its own prices as soon as its rival reduces his.

Another reason for the limited interdependence of electric and gas prices is the character of the demand for the two services. When either gas or electricity is used for cooking, water heating, refrigeration, and special kinds of industrial heating, the consumer must have some expensive appliances. Before electricity can be substituted for gas in domestic cooking, the consumer obviously must have an electric stove. As long as the gas stove, gas water heater, or gas refrigerator is not worn out or obsolete, families often are not responsive to ordinary reductions of electricity prices. Even when the gas-fired appliance wears out, the family may be inclined to replace it with another gas appliance. If housewives become accustomed to cooking with either gas or electricity, only sizable economies can induce them to give up the utility service to which they are attached.

The interdependence of the residential electric or gas prices also is affected by product differentiation. Electric and gas companies advertise freely, emphasizing the characteristics of their services that are likely to attract the attention of buyers. Gas companies emphasize the economy of their heating services in comparison with electricity, though electric and gas interests present conflicting evidence of the comparative costs of the two services.[26] Consumers are "sold" as much on the convenience and even the beauty (so the salesmen say) of electric appliances as on the cost of electricity. The advertising of electric companies tries to fix the idea of all-electric kitchens or all-electric homes in the consumers' minds. This advertising works. To increase their cooking, refrigeration, and water-heating sales, the electric companies often use slogans, pictures, and sales talks instead of lower prices. And the managers of gas companies are alarmed by such successful product differentiation, by the "millions of dollars" the electric industry (including the appliance manufacturers such as General Electric and Westinghouse) spends to convince buyers that the "electric way" is the "modern way."[27]

Regulation of Interutility Rivalry. State commissions do not have a regulatory policy for the competition of gas and electric companies. And the Federal Communications Commissions does not try to control the rivalry of AT&T and Western Union. If the sellers of these substitutable services try to take customers away from each other with price reductions, salesmanship or service innovations, the commissions are indifferent to the selling practices. The same regulatory attitude holds, too, for competitive practices that accompany the development of a new business such as household refrigeration. At the same time the regulators do not demand competition from the sellers of these imperfect substitutes. If the sellers of these dissimilar utility services are reluctant to compete with each other or even if they agree collusively on price and service policies, commissions still leave the practices in the hands of utility-company managers. Interutility competition simply does not provoke regulatory action. Either the commissions do not think that the competition is important; or they do not know how to deal with it; or they actually want some competitive control, even though imperfect, of utility prices.

COMMON CONTROL OF GAS AND ELECTRICITY

Affected by the corporate changes of public utility financiers, the electric and gas services of a market area did not always stay under separate managers. They often were brought under common corporate control, stopping whatever imperfect competition they once practiced. After many operating companies were consolidated before 1930, a single company often performed the gas and electric services in the same area. These composite companies were more numerous after 1930 than pure electric companies. And the electric revenue of these companies was predominant; in 1937 their revenue was more than four times as large as their revenue from all other utility services.[28] But corporate unification was not the only means of common control: before 1930 the holding companies often acquired managerial control of gas and electric companies that served the same market.* Fixing managerial policies for their operating companies, holding companies could stop, temper, or redirect the rivalry of electric and gas companies.† Holding-company restriction of interutility competition did not last long, however, because the Securities and Exchange Commission broke up nearly all holding-company control of rival electric and gas companies.

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* After the Federal Power Commission took over the collection and publication of electric statistics, government reports did not segregate pure and composite companies. Insofar as I know, the last available segregation was made in 1937 by the Department of Commerce when the *Census of Electric Industries* was published.

† When a holding company controlled the separate electric and gas companies in a market, it probably had less managerial control of electric and gas service than a composite company did. There was commonly some rivalry between the affiliated companies and their managers. But the rivalry was mild; it was an intramural sort of competition. Yet, even though the competition was temperate, the managers of the separate companies could be jealous enough of each other's growth to do some competitive advertising and appliance salesmanship. And they were observant, too, of each other's price and service changes.

The SEC Policy. State commissions do not break up composite gas-electric companies, and they do not try to eliminate common corporate control of rival gas and electric companies. The Securities and Exchange Commission, on the contrary, does separate the management of electric and gas properties as it reorganizes holding-company systems. Authorized to restrict holding companies to single integrated systems, the SEC examines and sometimes rejects combinations of electric and gas properties. These are the main questions: can both electric and gas properties be included in a principal integrated system, or can a holding company count either a gas or an electric system as an additional integrated system? To answer these questions, the commission studies primarily the magnitude of the additional gas or electric service and the economies of joint operation.

When an advisory opinion was issued for the American Water Works system, the retention of minor gas operations was approved.[29] On the other hand, the Columbia Gas & Electric Corporation, whose operating properties were located in the upper Ohio Valley, was ordered to choose between an integrated gas system and an integrated electric system.[30] The electric properties and gas properties of the Columbia system usually were operated separately. And the commission believed, furthermore, that the Holding Company Act did not provide for an integrated electric-gas system; the law defined an integrated gas system and an integrated electric system, but it did not define an integrated electric-gas system.[31] These views were expressed, too, for the United Gas Improvement system that was limited to electric operations around Philadelphia.[32] In another case a small gas system, which received only 7 per cent of the total revenue, was declared to be a separate system.[33] After 1941 the SEC seemed to have a definite policy: it attempted to put electric and gas services under separate managers, unless one of the services was distinctly incidental to the other or unless large joint production economies could be obtained.[34]

When a holding company controlled separate electric and gas companies, it was ordered to sell the securities that it held in one of the companies. The integration control was carried further. Holding companies were not allowed to manage operating companies that sold both electric and gas service. Not only holding companies but also operating companies were forced to sell their assets. Breaking up composite companies, the SEC encroached on the regulatory domain of state commissions. Even if these did not have a definite regulatory policy for interutility competition, they did not object to separate management of electric and gas service. They, too, apparently thought that, as a consequence of electric and gas competition, some benefits could be obtained for consumers.

When the SEC made decisions about joint management and control of electric and gas services, it gave careful attention to cost economies. Savings in managerial and labor costs received more attention than selling economies such as reductions of advertising and salesmanship costs. The commission insisted, moreover, on "substantial" economies. An operating company, performing both electric and natural gas services, was told that an inefficient gas plant was not part of an integrated system.[35] Even though a firm claimed joint economies equal to 40 per cent of the net earnings from gas service, the commission did not approve a combination of electric and gas operations.[36] And the companies were expected to make clear showings of the economies.[37] On the other hand, the commission approved some mixed electric-gas systems, largely because the divorcement would destroy "substantial" joint economies of operation.[38]

The SEC did not say clearly that it sought a competitive relationship between electric and gas service. It did not make a public issue of competition. There was nothing in the Holding Company Act that made gas-electric competition a necessary condition of corporate integration. Being guided by the statute, the commission usually did not mention competitive price control as the separation orders were issued. Yet in one case the commission said that

> . . . gas and electricity are natural competitors. Especially when both operations are conducted in the same territory, joint control creates the danger that one business may be suppressed in favor of the other or be made to carry the other. Economies claimed to result from joint operations must be measured against the possibility that independence will permit unsuppressed development and growth for both types of businesses.[39]

And in another case, where the commission compared the gas consumption, rates, and expenses for composite companies and separate gas companies, the commission said again that "it is the inevitable tendency of the joint control to favor that business in which it [the composite firm] is most interested and which is most profitable."[40] Judged by these comments, the SEC had a real interest in what it called the "vital competition" between electric and gas systems. But the commission did not say how intensive the competition was expected to be; nor did it explain how the competition of electric and gas companies reduced the costs and prices of the substitutable services. A public policy of competition was explained more, perhaps, by the American competitive tradition than by the economies, efficiencies, and consumer prices of the rival utility services.

Economies of Composite Companies. Even if the SEC insists on "substantial" economies of joint electric and gas service, any economies should be considered as a regulatory policy is fixed. When a single company performs both electric and gas service in a market area, it can economize some managerial and selling costs. A composite firm, selling both electricity and gas, probably spends less for managerial salaries than is spent by separate companies. Other economies may be realized, too, in connection with office buildings and general plant supervision. Customer costs can be reduced when one employee, instead of two, reads the electric and gas meters in each home, or takes care of service complaints in a neighborhood. Unlike rival gas and electric companies, the composite firm does not always lose revenue when consumers substitute electric service for gas service, or shift from gas service to electric service. Untroubled by the interdependence of electricity and gas prices and safeguarded from the loss of customers, composite companies can spend less for advertising and appliance salesmanship than is spent by the separate companies.*

A composite company can choose either electricity or gas as it formulates investment plans for domestic service extensions or a general plant expansion. It can choose between gas and electric service as the most profitable limits of operation are sought. If the costs of one service are less than those of the other and if the buyers are willing to take either service, the most economical one is "pushed." Since electricity can be used for more household purposes than gas, a company can invest in an electric extension to domestic buyers rather than a gas-line extension or both electric and gas extensions. When utility service is extended, for instance, to a new but sparsely settled suburban area, a composite firm can build only an electric line and economize the plant investment. Buyers in the sparsely settled area may pay more for electric water heating and electric cooking service than the families of the densely populated areas pay for gas for the same uses. But the company minimizes the costs of service in this manner, and can afford, therefore, to extend its market limits further.

Where both services are available to consumers, the composite firm can "promote" electricity for some uses and gas for others. Taking account of future technical changes and future costs of production as well as available plant capacity and current costs of production, the company encourages the use of gas, perhaps, for domestic heating purposes, while the use of electricity is emphasized for lighting and most appliances. But the choice of the most profitable service for domestic customers can vary: some companies, expecting more technical changes in electric service than gas service, prefer the electric stove while other companies, giving greater weight to current production costs and available plant capacity, prefer the sale of gas stoves.* If the borderline cases such as the choice of electric or gas stoves are not emphasized, the important fact is the selection of economical investments—the managerial opportunity to choose the most efficient use of public utility resources.

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* Not only do customers gain something from the cost reductions, but also they are not subjected to the deception and nonsense of advertising copy and salesmanship patter. A composite company gains little or nothing when it gives customers misleading or confusing information on the comparative costs of gas and electric service, or when it tells consumers how beautiful or convenient both the electric and gas appliances are.

Having an opportunity to economize the costs of production, a composite company can get larger earnings than those of separate gas and electric firms. That is one reason, of course, for mergers of separate electric and gas companies. But these benefits do not belong altogether to the investors of the composite company. They can be used for gas and electric rate reductions, or for further extensions of service. When the New York Commission approved a consolidation of the largest electric and gas companies in New York City, it did not believe that the joint production economies for the two services would go entirely to the investors.[42] At a later time it expected to turn the cost economies of the consolidation into price reductions for consumers.

Effects of Divorcement. Separate managerial control of gas and electric service is expected, so its proponents avow, to give consumers either lower prices or better service than that provided by composite companies. These service improvements and lower prices are expected to come through competitive action—through rapid introduction of service improvements, and through price reductions as each company tries to get more business. Separate gas and electric firms probably utilize innovations more quickly than is possible in a composite company; at least a slow rate of innovation is a standard argument against monopolies. A composite company naturally tries to protect its investment in either the electric plant or gas plant. It withholds investments in, say, electric service improvements that can affect the investment in the gas plant, that may cause buyers to shift from gas service to electric service, leaving unused gas plant capacity and reducing the earnings of the gas department. Using an innovation that reduces costs of production, a composite firm can reduce its prices, increase the electricity sales, and obtain more electricity earnings; but it does not install the improvement because the earnings of the gas department can be reduced. On the other hand, a separate electric or gas company need not consider the effect that innovations have on the plant investments of the rival company. When a separate electric company takes up an improvement in the generation or transmission of electricity, it is interested in its own costs of production and its own earnings. And natural gas service, for example, is substituted for manufactured gas service when the gas company foresees an increment in earnings. Ignoring the immediate or ultimate effects of service improvements on each other's earnings, separate electric and gas firms do not hold up the slow process of plant and service changes so much as composite companies do.

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* Protagonists of gas service, such as gas appliance manufacturers, sometimes charge that the managers of composite companies are biased.[41] They say that the managers of these companies are "electric minded" instead of "gas minded"—that their engineering training or the modernity of electric service misguides them.

Rival electric and gas companies can engage in price and quality competition. Seeking larger sales or protection of its customary sales, either company can reduce its prices. Or one firm, trying to get a large share of a new market such as that of refrigeration or even attempting to take old customers away from the rival company, can reduce prices, offer service innovations, or develop more friendly buyer relations and special consumer services. Some price and quality competition has been common between independent gas and electric companies. As electricity has been adapted to new uses, the managers of gas companies have struggled to hold their markets. They have tried to match the advertising, service innovations, and new appliances of electric systems. Gas companies have been affected not only by improvements of electric service, but also by regulatory or voluntary reductions of electric rates; the managers of gas companies have known that a substantial reduction of electric rates ultimately would affect the demand for gas service. Yet gas systems usually have not engaged in open, continuous price competition with electric firms; both the price and quality competition of these companies, like the interdependence of gas and electric prices, always has been imperfect. Sometimes the competition has been obscured altogether by product differentiation, and by the expansion of both electric and gas firms. Indeed, the electric companies, the leaders in the mild competition, often have seemed to ignore gas company reactions to electric price and service policies.

If the SEC thinks that separate electric and gas firms will compete aggressively with each other, it is likely to be disappointed. Just as two gas companies or two electric companies cannot be forced into price competition, so independent gas and electric companies cannot be compelled to compete with each other. Instead of a bitter competitive struggle, marked by retaliatory price reductions, the two firms can readily agree on price and service policies. They can divide the market, and take a "live and let live" view toward each other. Commission regulation of earnings and prices, moreover, disturbs the competitive struggle. Utility firms cannot reduce prices at one time and increase them later so easily as is possible in unregulated companies. They know that buyers quietly accept price reductions but roundly condemn price increases, and that commissions commonly investigate proposed increases in prices. There is a downward bias in the regulation of utility rates. If composite companies are broken up or corporate affiliation of rival gas and electric companies is severed, a sharp competitive struggle between the two systems is not a certainty. At least the managers of utility companies commonly avoid direct, permanent price competition. But independent gas and electric companies usually engage in some quality competition. They make expenditures on product differentiation and appliance salesmanship, trying to exploit the domestic buyer's inability to make intelligent choices between electric and gas service.

Even if separate gas and electric companies do compete with each other, the competition is not a satisfactory substitute for earnings and price regulation. At best this competition is imperfect and irregular; this is a rivalry of dissimilar systems which compete for sales in some markets (e.g., domestic cooking), and are independent in other markets (e.g., space heating). Price and service practices can be affected by the competition, but the firms still can obtain excessive earnings. Even when the companies voluntarily reduce their prices or improve the quality of their services, one or both of the companies still can obtain more than reasonable amounts of earnings. Commission regulation of earnings and prices still is needed for another reason: if this competition does affect prices, the price structure of the companies can be molded into a discriminatory shape.* Electric companies, trying to take sales away from gas companies, reduce their prices for domestic cooking, water heating, and special sorts of industrial heating. And they do not change the prices for such services as electric lighting, many domestic appliances, or electric motors, because gas is not used for these purposes. When buyers can choose between electricity and gas, they get price reductions; they benefit from the competitive policy. Prices are differentiated according to the demand relation—according to the substitutability of gas and electric service. And discriminatory pricing, which commissions are supposed to restrict or eliminate, is accentuated.

NONUTILITY COMPETITION[43]

All utility services, except water, compete in some degree with nonutility commodities. Some nonutility commodities can be substituted for utility services. They are not perfect substitutes just as one utility service is an imperfect substitute for any other utility service. Yet buyers often are aware of alternative choices between utility services and nonutility commodities. Buyers can choose between telegraph or telephone service on the one side, and air mail or regular mail service on the other. Providing a means of communication that becomes more speedy and extends to more of the country every year, air-mail service often is a good substitute for either telegraph or telephone service. Air mail gives a written record of communications just as telegrams do, and it is much cheaper than either telegraph or telephone service. As it continues to improve, air-mail service is certain to take business away from Western Union and AT&T. Yet the Bell system and Western Union, emphasizing the speed of their services, apparently do not try to lower their prices so that they can compete with postal service. To attract many users of mail service, they must make large reductions in telegram and telephone rates. They cannot afford these reductions; at least they behave as though competitive pricing of this sort will bring less profits or even deficits. Consequently these utility companies do not try, except with advertising and product differentiation, to influence the substitution of telephone calls or telegrams for mail service.

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* For a further discussion of the nature of discriminatory pricing see Chaps. 26 and 28.

The demand for urban transportation service was affected by the development of the automobile. After the First World War ended, the use of private automobiles reduced the demand for streetcar and bus service. Sometimes cut-rate taxis, too, reduced the demand for street railway and bus service. When private auto transportation was substituted rapidly for street railway and bus service, reductions of the streetcar and bus fares did not stop the substitution. Families own and operate cars for other reasons than the prices of urban transportation service—for speed, prestige, and convenience. They do not compare the costs of operating cars with transportation fares and then choose the most economical transportation. Consequently there is no large measure of interdependence between the cost of automobile transportation and urban transportation fares.

The prices of gas service, particularly those of natural gas service, are related to the prices of coal and fuel oil. If managers of gas companies wish to develop certain kinds of gas service, they must take account of coal and fuel oil prices. Since buyers exercise their alternative choices between coal, fuel oil, and gas, the gas companies must recognize the interdependency of the fuel prices. The demand relation between the several fuels varies according to the kind of use to which they are put. In the case of domestic cooking, where buyers are willing to pay for the conveniences of gas service, the gas systems are more concerned about the substitution of electricity than the substitution of coal or fuel oil. But gas companies must give careful consideration to coal and fuel oil prices as they fix gas prices for home heating and other space heating. And the price relation is the prime consideration as most industrial sales are promoted. Some consideration, too, must be given to fuel oil prices as the gas prices are chosen for domestic water heating, because in many markets oil and gas are close substitutes for this service.

When natural gas lines were built after 1930 to many large urban markets, the gas industry came into close competition with the producers and retailers of coal and fuel oil. To utilize their large and costly pipe lines, the gas transmission companies had to obtain new heating customers. They had to find outlets for gas other than the customary business—the domestic cooking and water heating sales of the manufactured gas companies. Lowering the wholesale price of natural gas, the pipeline companies made it possible for gas distributing companies to develop two new markets. One of these was space heating, the heating of homes and other buildings. Wherever long gas pipe lines were built, the use of natural gas for space heating increased greatly after 1930. Another market was industrial heating. Selling their gas at lower prices to industrial buyers than to any other buyers, some distributing companies acquired large, new markets.

Regulators did not try to control the competition between gas and nonutility fuels. They allowed companies to substitute natural gas service for manufactured gas, or to introduce natural gas service in towns that never had any kind of gas service. When certificates were issued for natural gas service, state commissions usually did not consider the effect of the natural gas sales on the coal industry. This was not the fault of the leaders of the coal industry. In regions where this was the common fuel the mine operator associations, associations of coal dealers, and the United Mine Workers often vigorously opposed and sometimes delayed the construction of natural gas lines.

Several state commissions and the Federal Power Commission heard the arguments of the coal interests. But considering the general welfare of their states, several commissions ignored these protests and issued certificates of convenience and necessity to natural gas companies.* In Utah the coal-mining towns and railroad companies objected to a certificate for a natural gas company that sought to serve the Salt Lake Valley. But the Utah Commission believed that its duty to "Utah citizens in general" justified the construction of natural gas lines and the sale of natural gas.[45] Similarly, the Tennessee Commission granted a certificate for a natural gas line, and said that the "special claims" of coal and railroad interests should not "prevail against the superior interests of the general public welfare."[46] The New York and Wisconsin Commissions, too, chose the economies of natural gas service rather than the preservation of coal sales and railroad revenue.[47] State commissions have not protected vested interests in the coal and railway industries; nor have they taken a broad social view of output controls.

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* And when the coal-mining interests opposed the construction, even in important coal-mining states, of hydroelectric projects, they were unable to secure the support of utility commissions.[44]

Coal-mining interests also object to the pricing policies of natural gas companies. When they cannot stop the introduction of natural gas service, they want the gas prices to be fixed so that coal sales can be maintained. If the coal interests get just what they want, the prices of gas are high enough not to disturb coal sales. These interests wish to stop the sales of gas altogether, unless a few special, high-price uses can be found for gas. The coal-mining companies and labor unions dislike the low prices for space heating or general industrial heating with gas. Accustomed to coal production for home furnaces and manufacturing uses, they are determined to protect their "rights" in these markets. Commissions can escape the complaints of the coal interests; but they do not have authority to control the gas-coal relationships. Lacking authority to regulate the price relationships of utility and nonutility industries, the Illinois Commerce Commission dismissed a complaint of coal dealers against low prices for natural gas.[48] At first the Federal Power Commission, too, did not consider the effects of natural gas prices on coal sales, and was supported by a federal circuit court.[49]

In the middle forties the Power Commission began to show signs of changing its attitude. It undertook an "end-use" investigation for the natural gas industry in which the testimony on conservation was directed primarily toward industrial and other low-grade consumption of the limited gas supply.[50] And some commission orders, designed apparently to protect the vested interests of the coal industry as well as to conserve natural gas for domestic uses, were issued to limit or to prevent sales to large industrial customers.[51] At least the commission thinks that coal and rail interests should be considered as the gas service expands.[52] Going further with this policy, the Power Commission can be the friend and defender of the coal-mining companies, railroads, and coal miners. In any case these interests are concerned with coal production and transportation, not with wise conservation and economical utilization of the scarce resources of the nation. Trying to preserve the production of coal, the value of coal-mine investments, railroad revenue, and the jobs of coal miners, they are willing to obstruct the use of a new and more economical fuel.

PARTIAL RELIANCE ON COMPETITION

Public authority is not yet substituted completely for competitive control of public utility prices and service. Now and then the commissions allow one firm to compete directly with another company in the same industry because the old firm is inefficient, because a slightly different kind of service is offered, or merely because the temptation for competitive price reductions cannot be resisted. State commissions seem to be indifferent to interutility competition, but the SEC covertly encourages an electric-gas rivalry as it reorganizes holding companies and their operating subsidiaries. State commissions usually do nothing to control the rivalry between utility and nonutility industries, but the Federal Power Commission shows an interest in the coal-industry protests against an expanding natural gas business and apparently wishes to limit the full competitive effects of the new business on the established industry. Again the policy makers do not explain their varying actions so that the public purposes are clear and understandable. State commissions do not describe the lasting social benefits of their occasional lapses from authoritative control; the SEC fails to show how gas-electric rivalry is expected to work or how it can provide better social consequences than public regulation; and the Power Commission is demonstrating more political awareness than social thinking as it works gently with gas-coal competition, as it tries to protect jobs and investments in the "sick" coal industry while also sponsoring an expanding gas business. At any rate a vestige of competitive control still survives here and there in the utility industries, though public control of prices, earnings, and service was adopted years ago.

Chapter 10

The General Pattern of Earnings Regulation

NO PURPOSE of public utility regulation is given so much attention in the United States as the restriction of companies to reasonable earnings. Regulators are expected to eliminate the excessive earnings of utility companies, either by reducing their prices or by increasing their obligations to serve consumers. A primary duty of utility commissioners is control of the monopoly returns—restriction of the exploitive powers of companies. If a company has, as it usually does, exclusive control of a market, it has an opportunity to earn monopoly returns—to administer prices and maximize earnings. Unless monopoly returns are erased by price reductions or new service obligations or both, the states and cities give utility companies valuable privileges when they grant them franchises and certificates. If exclusive markets are granted and if, at the same time, the buyers are not supposed to be exploited by the private firms, regulation of earnings is a necessary policy.

COMMISSION AND JUDICIAL ENDS

The reasonable earnings of utility companies are not market-place phenomena; they are not objectively determined by the counterplay of buyers and sellers. Since a single utility company has more bargaining power than small buyers, legislatures do not think that market forces, the traditional controls of business earnings, should be relied on to determine public utility earnings. Market conditions still determine the earnings of most American business enterprises, but the lawmakers do not accept them as controls of utility firms which have exclusive markets or only a few rivals. Unlike the earnings of most other business firms, the actual earnings of utility companies are not presumed to be reasonable. Neither the actual earnings nor the earnings objectives of investors and private managers are necessarily the choices of the commissions and courts.

Forsaking a market or managerial standard, the commissions and courts set up a judgment standard of earnings regulation. Although some commissions make arbitrary decisions now and then, the courts and most commissions, using available facts and acting in a conscientious manner, try to set attainable, reasonable goals of regulation. Their decisions generally are the responsible acts of scrupulous regulators rather than whimsical or ruthless conclusions of untrustworthy men. Given the legal and economic conditions of regulation, the regulators decide what is the right amount of earnings for a certain time and place. The reasonable standard is not a simulated competitive standard of earnings, though the general equation of total costs and total revenue of utility service seems to bear a resemblance to the "normal" competitive standard of earnings.* While the reasonable earnings are less than the market-determined earnings for prospering companies, commissions do not ignore altogether the earnings expectations of managers and investors. The continuation of private ownership and management of utility plants is taken for granted. But no precise formula can be constructed to measure the reasonable earnings. There is, however, a general formula in the sense that commissions have a common methodology as well as a common purpose for earnings regulation.

The Attitude of the Commission. A commission can take an impartial position in earnings and price regulation, acting as a sort of judge of conflicts that arise between utility companies and their consumers. Or it can be a defender of either consumer or investor interests. When the state legislatures created commissions in the first part of the twentieth century, the main purpose of regulation was protection of buyers against the acquisitive private companies. Investors did not need protection from the aggression of consumers; the buyers usually were incapable of much aggression. But many small consumers, who could not bargain effectively with a much larger and monopolistic seller, needed public protection against high prices and inferior services. If there were no public regulation, consumers could take their complaints to the courts and start common-law actions against the companies. Not many consumers were likely to start court cases, however, because they lacked evidence or seldom were angry enough to be well united against the companies. And even when court proceedings were started, the companies could overwhelm the consumers with legal talent, engineering testimony, and extensive factual studies of costs and revenue.

Although the consumers' bargaining and legal position often was weak, some commissions assumed a judicial manner during the early decades of regulation. A case was started when a group of buyers or a city petitioned the commission for a hearing; the consumers (or city) and the companies offered evidence; and the commission decided the case on the presented evidence. This judicial attitude favored the companies, allowing them to use their superior legal and investigative abilities. During the thirties this attitude changed. After a great economic depression had disturbed the old faith in private management and put new life in public utility regulation, commissions commonly gave more attention to administrative work and less consideration to their judicial function. In most states they clearly became open defenders of the consumers, initiating investigations on their own motions and gathering much factual evidence to counterbalance the findings and shrewd aggression of the companies.

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* Because commissions and courts want to equate the total costs and the total revenue of utility companies, some persons see a connection between competitive control and public administration of earnings.[1] To them the commissions seem to be simulating the effects of competition on the earnings of a company. But nothing in the thinking or action of commissions and courts clearly reveals that reasonable earnings control is patterned along the lines of competitive earnings and price control.

While most commissions now are definitely on the side of consumers, they cannot be indifferent to the wants of investors. Even if their decisions are final and are not subject to judicial review, regulators cannot ignore altogether the earnings objectives of the utility companies. Consumers are dependent on public utility investors; they rely on the private investments that maintain the utility plants and assure the continuation of service. Investors are not compelled, of course, to lend their funds to public utility companies. They can withhold their investments unless the commissions allow the utility companies adequate earnings—enough to make public utility investments as attractive as alternative investments. The commissions, therefore, must reckon with investor expectations as the reasonable earnings are determined. When a company has an adequate plant and does not need investment funds immediately for plant expansion or plant replacements, the commission can, except for judicial protection of property values, press down the earnings of the company below a reasonable level. In time such a policy, however, catches up with the commission and consumers, reducing investments in utility operations and thereby impairing the service that the consumers buy. A regulator must recognize, as a part of earnings regulation, that investors can choose between a number of utility and nonutility investment locations. Recognizing this fact, a commission is not free to prescribe *any* improvement in plant, *any* standard of service, *any* price, or *any* amount of earnings.

Most commissions apparently consider the earnings expectations of utility companies. They commonly do not take a wholly short view of reasonable regulation, ruthlessly forcing price reductions on the companies and ignoring the ultimate effects that low prices and burdensome service obligations have on private investments in utility operations.* They have respect for the past investments in public utility plants. This temperate policy not only is shown at the time of an earnings investigation, but also is revealed by infrequent inquiries. Companies are not subjected to earnings investigations every year; instead, the earnings and prices of many firms are not carefully examined more often than once every five or ten years. There are long interludes between investigations. And during these intervals the companies can receive more than reasonable earnings. Small excesses in earnings, in fact, can go unnoticed for years, because commission regulation generally is directed toward the firms that have the most excessive earnings. Regulators stand ready to eliminate the monopoly returns of utility companies, but they do not try to squeeze out every bit of excessive returns as soon as these appear. The administration of earnings regulation, particularly in connection with moderately excessive returns, is somewhat loose and tolerant rather than meticulous and severe. Unlike the consumers who always want price reductions, the regulators have moderate demands and try to anticipate some future financial conditions of utility operations.

In the past half century the regulators were more concerned with excessive earnings than with deficient returns. Dealing usually with expanding companies that profited from many technical economies and demand increases, the commissions effected more price reductions than price increases. These experiences are likely to be reversed in the near future, because the prospects of profits do not seem to be so good as they once were in the electric, gas, and telephone industries. Company petitions for price increases probably will be more common. The power of organized labor increases operating, maintenance, and investment costs; and wage rates as well as raw material and construction costs of utility firms are increasing. A general but moderate inflation of prices, extending throughout the economy, is bound to affect the production costs of utility companies. Taxes are higher than they once were; and significant abatements are not in sight. At the same time the companies may not get the kind of demand increases and cost-reducing innovations that once assured them of additional returns.

Commissions, set up to protect the interests of consumers, naturally are not anxious to grant higher prices to the companies. Just as they do not eliminate extra earnings as soon as they appear, so they cannot be counted on to increase prices as soon as the deficiencies show up. For one thing, they have a regulatory history in which reductions of excessive earnings and prices are predominant; they are accustomed to a downward course of prices. And as a further fact the regulators are certain to experience political discomforts if they yield immediately to the managerial demands for higher prices; most consumers probably are ready to criticize any increase in utility rates no matter what the cost and revenue evidence is. So, the price increases frequently may be delayed while the commissioners try to trim the measurements of reasonable costs or hope for enlargements of revenue—and while the private firms continue to incur what they consider less than adequate returns. Changing demand, technical, and cost conditions seem to call for new regulatory perspectives, though the commissioners need plenty of time to recognize new situations and to formulate new attitudes. Yet the shape and consequences of regulation are quite certain to yield eventually to new, permanent conditions of production.

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* Even when the Office of Price Administration had a "hold-the-line" policy against inflation during the Second World War but did not have full control of public utility rates, state commissions allowed occasional price increases;[2] they were not determined to enforce any earnings reduction despite the national interest in widespread price control, and some of them did not wish to abandon pricing procedures such as sliding scales (see Chap. 18) or fuel clauses. In general, however, the OPA and state commissions were not in conflict; both disliked price increases, and the OPA afforded some opportunities for price reductions by holding down commodity costs while the companies experienced significant demand increases.

Judicial Review. Neither the legislature nor its commission is the final authority on what are the reasonable earnings for a utility company. Commission decisions are subject to judicial review, though only a small fraction of commission orders are appealed to the courts. In the Nebbia case the Supreme Court said that ". . . a state is free to adopt whatever economic policy may reasonably be deemed to promote public welfare. . . ."[3] This statement seems to imply that a commission has almost unlimited opportunities for regulatory action. This is not true. At the time of the Munn case in 1877 the Supreme Court was willing to leave the choice of public regulation to the legislature, or to the commission to which the legislature delegated regulatory powers. During the twentieth century, however, the Court steadfastly refused to concede unlimited discretion to regulatory bodies. Accepting the responsibility for regulatory justice, the Supreme Court now stands as the highest authority in public utility control, and is always ready to protect the companies against the arbitrary actions of the commissions. The federal courts and the state supreme courts afford companies some chances to temper the regulatory actions of commissions. Failing to get the kind of commission decision it wants, a firm can appeal to the courts for relief. And it can keep on appealing one adverse court decision after another until it reaches the Supreme Court. Expert investigations and opinions of the commissions are thrown aside, the cost of regulation increases, and price and service changes are delayed—these can be the effects that judicial review has on commission regulations. Yet the right to judicial review remains.

The Supreme Court is not yet willing to give up its authority, and turn back to the Munn opinion.

The present legal pattern of reasonable earnings regulation developed during the late nineteenth century and the first quarter of the twentieth century. This was a time when an important part of the work of the Supreme Court was the interpretation of the Fourteenth Amendment to the Constitution. According to this amendment, persons could not be "deprived of life, liberty, or property without due process of law." In public utility regulation, as in other social controls of business, a meaning for "due process" of earnings and price regulation had to be worked out. Taken alone, "due process of law" had no clear, evident meaning. It was devoid of meaning until the Supreme Court, deciding one case after another, finally gave it meaning. At any rate, the Court tried to explain and circumscribe the "taking" of property by "due process of law." As the Court decided more and more due-process cases, it began to distinguish between two characteristics of due process of law. One of these was a substantive problem: the determination of reasonable amounts of utility company earnings. The other was a question of "due" procedure, a question of what sort of commission investigation and hearing was proper in each case.

The substantive problem of reasonable earnings has been dominant in judicial review. The critical problem always has been the meaning and measurement of reasonable earnings. Thinking in terms of the property rights rather than the financial conditions of utility companies, the Supreme Court usually has based its measures of reasonable returns on some kind of property valuation. For years the general rule has been a fair return on a reasonable property value. But the fair-return standard has not clarified the meaning of reasonable earnings; the fair return has been no more than a synonym for the general concept of reasonable earnings. For a half century the judicial review of utility regulation has been focused more specifically on the meaning of a fair value of property. Several kinds of property valuations—original cost, prudent investment, and various versions of reproduction cost—have received judicial consideration. And alternative measures of property depreciation have found their way into the legal thinking about reasonable earnings. Examining facts and trying to reconcile conflicting thoughts in many decisions, the Supreme Court has wanted to establish a workable standard of reasonable returns. Yet, despite its struggling, the Court never has solved the problem to its own satisfaction, never has found an unassailable and clearly efficient measure of reasonable earnings.

The other part of due-process regulation, the requirement of a proper regulatory procedure, disturbs commissions less than the substantive problem of a reasonable-earnings measurement. A utility company, like any other litigant in our democratic society, must be given a fair and open trial. And the Supreme Court forbids the use of "arbitrary" regulatory procedures. In the Northern Pacific case of 1925 the Supreme Court said, "An order based upon a finding made without evidence, or upon a finding made upon evidence which clearly does not support it, is an arbitrary act against which courts afford relief." [4] A commission, furthermore, cannot withhold a description of its reasoning, or a statement of the facts that influence its decision. This requirement is stated clearly in the Ohio Bell Telephone case of 1937. Speaking for the Court in this case, Justice Cardozo rebuked the Ohio Commission because it failed to explain how the property value of the company was measured with index numbers.* As a matter of fair regulatory procedure he was not satisfied to accept the commission's conclusion without seeing evidence of facts and thinking—without knowing whether the decision was based on reason or administrative prerogative.

A full hearing also requires that the administrators, who are responsible for regulation, cannot always leave the study of facts and regulatory conclusions to their employees. In 1936 this was the decision of the Supreme Court in one of the Morgan cases.[6] The Secretary of Agriculture, who was responsible for price regulation of stockyards' services, entrusted the finding of facts and even the shaping of regulatory policy to his employees.† Thinking of the Secretary's duty as "akin to that of a judge," the Court said, "The one who decides must hear." [8] But in 1941, when the same stockyards case came to the Supreme Court for the fourth time, the Court took a more temperate view of the responsibilities of the Secretary of Agriculture. Justice Frankfurter, who did not approve a court examination of the Secretary's conduct of the case and who thought cabinet officers were "men of conscience and intellectual discipline," said,

> The proceeding before the Secretary "has a quality resembling that of a judicial proceeding." Such an examination of a judge would be destructive of judicial responsibility. . . . Just as a judge cannot be subjected to such a scrutiny, . . . so the integrity of the administrative process must be equally respected.[9]

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* Justice Cardozo said, "The commission, withholding from the record the evidential facts that it has gathered here and there, contents itself with saying that in gathering them it went to journals and tax lists, as if a judge were to tell us, 'I looked at the statistics in the Library of Congress, and they teach me thus and so.' This will never do if hearings and appeals are to be more than empty forms." [5]

† When another Morgan case was decided in 1938 and when the main question was an adequate notice of the charges, the Supreme Court said that a fair hearing ". . . embraces not only the right to present evidence but also a reasonable opportunity to know the claims of the opposing party and to meet them." [7]

COMMISSION PROCEDURES

Most commissions can begin earnings investigations either on the petition of consumers, the petition of municipalities, or their own initiative. When regulators can initiate investigations and do not have to wait for consumer or municipal petitions, they have opportunities for more flexible action. A commission has accounting information that gives some indication of the excessiveness of the earnings of companies. Having accounting data and opportunities to make approximate measures of reasonable and unreasonable earnings, the commission can choose the companies that ought to be investigated. When the commission controls the time and place of earnings investigations, it can make an efficient allocation of its own regulatory resources. It can allocate the available staff and funds to investigations so that the largest rate reductions or the most significant service improvements are realized. The ordinary commission has a better opportunity than the consumers to choose investigations. Consumers and municipalities often are guided by guesses about utility-company earnings or by anger as they make petitions for investigations. The officials of some cities demand frequent investigations, while those of other cities, unmindful of their needs for regulation, rarely ask for investigations.

Commissioners usually do not anticipate excesses or deficiencies in company earnings. Controlling the initiation of regulatory action, a commission does not start an investigation until it believes that the company's earnings are excessive. And it does not grant a rate increase until the company incurs deficits. Nor are the earnings minutely controlled. Commissions commonly do not try to eliminate excessive earnings as soon as they appear. Regulators prefer expedient policies; allowing a fairly liberal return, they avoid criticism for the possible financial effects of more exact regulation. The frequency of earnings investigations is affected, too, by the commissioners' ability to perceive excessive earnings, by the expertness of the commission's staff, and by the amount of funds that are available to finance the investigations. When commissions control many companies, they usually do not consider price changes every year for each company.

The individual firm is the typical business unit of earnings regulation. This is one difference between earnings regulation of railroad or motor carriers and that of other utility companies. Several railroads or motor transport companies often serve the same area or the same cities. Unless prices are uniform, the shippers choose the firm with the lowest rates. Consequently the earnings regulation must be done for groups of railroads or motor carriers. On the other hand, each electric, gas, telephone, water, or urban transportation company usually has an exclusive market for its kind of utility service. It can be separated from other companies as earnings and prices are determined. Yet each firm is not always entirely autonomous in earnings regulation. When the costs of operation of one company are much higher than those of similar companies, commissions may not approve rates that cover all of the company's costs. Reasonable earnings regulation does not mean that consumers must pay any cost of service. Before the prices are fixed, the commission can study the efficiency of the company's management, the obsolescence of equipment, and the amount of unused plant. Most commissions, however, rarely study the efficiency of utility plants or the competence of company managers; they commonly accept the investment decisions, plant-maintenance policies, and current operating expenditures of the companies.

Kinds of Investigations. A distinction is made between informal and formal investigations.* Informal administration of earnings regulation, which is widely used by state commissions, often involves conferences between the company officials and the commission. An informal case is a negotiation between the company and the commission, where each side asserts bargaining force, uses persuasion, and introduces influential and readily accessible facts. Using the information in their files, many commissions have some prima facie evidence for earnings and price changes. Following the example of the California Commission, they can accumulate cost and revenue information about each company and carry on regular informal investigations. In most instances, however, informal control is not used continuously. It is used now and then as a substitute for more intensive, protracted investigations.

To effect reductions of earnings, several commissions make extensive use of conferences and negotiations.[10] This method of control became common during the depression of the thirties when commissions wanted to make immediate rate reductions. It is a quick and cheap way to change prices. Yet, even though the informal method is a quick way to reduce (or to increase) earnings, it is often a crude form of control. It is limited to earnings and price revisions for which a prima facie case can be made.[11] Perhaps the commission lacks information with which it can make a respectable measurement of reasonable earnings. And when a commission is trying to reduce excessive earnings, the effectiveness of informal regulation is limited by the bargaining force that the commission can assert, by the concessions that it can wheedle out of the utility companies. Even if they are skillfully managed, informal cases are probably less effective than formal investigations in reducing prices. Threatening companies with formal investigations unless they submit to informal regulation, regulators can realize some substantial price reductions. And they can avoid costly investigations of property values and operating costs, and can escape protracted litigation. Informal regulation is a useful expedient for an overworked but conscientious commission.

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* Informal proceedings are more common for such minor matters as defective meters than for earnings control. Informal complaints of this sort usually are handled by correspondence or a field examiner.

A formal investigation, on the other hand, is an extensive affair that is climaxed by a commission hearing on the evidence of the company and the commission. Studying the evidence on property valuations, accrued depreciation, "necessary" returns and operating costs, the commission determines the reasonable earnings and orders price changes where the earnings seem to be excessive or deficient. Formal investigations, which require detailed property valuation, cost, and revenue studies, are more expensive and last longer than the informal investigations. And even after the commission makes its decisions, the companies can extend the controversies by appealing to the courts for relief. If the commission is anxious to reduce the prices or to change the service standards immediately, a formal investigation can be concluded with negotiations between the company and the commission. The New York Commission, for instance, negotiates many earnings and price changes after it orders formal investigations.[12] And other commissions, including federal commissions, often settle cases by conferences and negotiations before the formal investigations are completed. Sometimes, too, a company proposes a negotiated settlement; after a formal investigation starts, a firm offers an immediate price reduction and asks for discontinuance of the investigation. It offers an immediate rate reduction in lieu of the unknown commission reduction. If the proposed price of the company seems reasonable to the commission, it is accepted and the formal investigation is stopped.

Temporary Rates. Conducting formal investigations, commissions commonly do not order price changes until the investigations are finished. A few commissions do not delay rate changes, however, until the prolonged investigations and hearings are concluded. While the cost and revenue facts still are being gathered and studied, the commissioners order immediate price changes. The new prices, which are based on available information, are called "temporary rates." In 1934 the New York Commission received authority to fix temporary rates. Under the New York statute a company is entitled to a 5 per cent return, and is reimbursed for any deficits that the complete investigation shows in the temporary rates.[13] The Pennsylvania Commission received a similar statutory power in 1937. In the Wisconsin Telephone case, a detailed and prolonged case, the Wisconsin Commission ordered temporary rate reductions, even though it did not have explicit statutory authority for the temporary rate regulation. Later, in a reactionary decision, the Supreme Court of Wisconsin condemned the commission's regulatory procedures and price experimentation, but did not clearly forbid the use of temporary rates.[14] The Federal Power Commission issued "interim orders" and effected temporary rate changes before 1940.[15] When the Supreme Court decided the Natural Gas Pipeline case in 1942, it expressly approved the temporary rate regulation of the Federal Power Commission.[16] But the Court stated clearly that the right of a company to a full hearing could not be disregarded, that temporary rates must be based on factual evidence rather than conjectures.

Customer refunds are alternatives to temporary rate reductions. When the old rates are used until the commission orders a permanent rate reduction, the consumers are entitled to refunds. The refunds to consumers are computed from the time when the commission orders an investigation; excessive earnings during a formal investigation belong to the consumers. If a formal investigation lasts for several years, a large amount of excessive earnings can accumulate and must be paid to many consumers. The cost of making refunds ranges from 5 to 15 cents per dollar of refunds.[17] And some former buyers, who move or die, never get their refunds.

Even the companies can benefit from the temporary rates. They may discover that their earnings under the lower prices are reasonable. Perhaps the company discovers an unknown elasticity of demand, and receives more rather than less total revenue. Temporary rate regulation can help companies, furthermore, that are seeking higher rates. Just as buyers are not forced to pay unreasonable rates until an investigation is completed, so the company is not required to incur deficits until all the cost and revenue data are compiled. When a measurable increase in raw material costs, taxes, or wage payments is incurred and the company obviously does not obtain reasonable earnings, prices can be increased immediately. The use of temporary rates gives flexibility to utility price structures, and reduces the irregularity of earnings.[18]

REASONABLE EARNINGS

The Supreme Court says that utility companies are entitled to no more than reasonable returns. The earnings of utility operations shall be high enough to avoid confiscation of the property of utility companies and to maintain production in a capitalistic environment. A reasonable return is a sort of "normal" return for an isolated company.[19] But the legal meaning of a reasonable return is not derived from economic thinking.* The reasonable return is an ethical concept rather than an objective, market-place concept. Treating the measurement of the fair or reasonable return as a special problem in justice, jurists try to balance the maximum-earnings objective of private companies and low-price objective of consumers so that the whole public purpose of regulation is served. The reasonable return is not measured exclusively by what either the consumers or the utility companies desire. And it is not any return that the commissions wish to fix. The social concept of a reasonable return temporizes the authoritarian control of commissions; the continuation of private utility service is anticipated and the social tenets of capitalism are respected. Neither the exploitation of buyers nor the confiscation of the property of private companies is tolerable.

The Supreme Court's concept of a reasonable return is really a notion of a zone of reasonableness. Confiscation of the property of a private company is the lower limit of the zone; exploitation of buyers, which is revealed by pricing practices and monopoly profits, is the upper limit. If the return is reasonable, it must fall between these limits. This return is not a single, specific sum for each company; any one of several returns can be reasonable.† Unfortunately the idea of a zone of reasonableness does not facilitate the measurement of reasonable earnings; the limits of confiscation and extortion still must be defined. The concept of a zone of reasonableness seems to be a convenience of judicial reasoning, an admission that reasonable earnings cannot be measured exactly. It seems to be a common-sense rationalization of the reasonable-earnings objective—a way to make a workable legal pattern for earnings regulation.

Utility companies are not assured reasonable returns. If a fair return can be obtained with some set of prices, a company has a right to the return. Low prices for service, which do not provide satisfactory earnings, cannot be forced on a company when a fair return can be obtained at higher prices. But some firms, operating in a decadent industry, may not be able to get reasonable returns with any prices. A substitute service develops; the demand for utility service decreases; and the contraction or even the complete abandonment of utility operations is inescapable. Faced with these conditions, a commission can do no more for a utility company, such as a street railway, than to choose the prices that minimize the deficits. When the Supreme Court decided the Market Street Railway case in 1945, it recognized the unavoidable fact of deficient earnings; the demand for street railway service in San Francisco was decreasing, price increases were not expected to bring in more earnings, and the financial status of the company was "hopelessly undermined." Writing the opinion of the Court, Justice Jackson said,

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* Unless they deal with purely competitive market conditions, economists do not make the meaning of a normal return any clearer than the Supreme Court makes the meaning of a reasonable return.

† The Supreme Court, adding to the legal confusion of reasonable-earnings regulation, has observed that a nonconfiscatory return is not necessarily a reasonable return.[20]

> . . . it may be safely generalized that the due process clause never has been held by this Court to require a commission to fix rates on the present reproduction value . . . or on the historical valuation of property whose history and current financial statements showed the value no longer to exist. . . . The due process clause has been applied to prevent governmental destruction of existing economic values. It has not and cannot be applied to insure values that have been lost by the operation of economic forces.[21]

The Cost Measure. Commissions and the Supreme Court measure the reasonable return, for the most part, according to the costs of utility services. Sometimes a comparison of the rates of several companies is offered, usually by buyers who like the tangible and simple nature of the comparisons, as evidence of reasonable or unreasonable prices. Yet these rate comparisons do not receive much attention in earnings regulation.[22] Companies and commissions agree on a cost basis of earnings regulation, but they do not agree on the measurement of the costs. Determination of the reasonable costs of service is the real controversy of public utility regulation. Seeking protection of their earnings, utility companies present evidence of high costs of service; defending the interests of consumers, commissions compute low costs of service; and trying to find a point of equilibrium in the conflict, the Supreme Court proposes cost measurements that often are between the private and regulatory measurements.

A general cost formula for reasonable earnings can be identified. It is the one that adds together the operating expenses, the depreciation cost of useful property, and a reasonable return on useful property. Judged by past legal controversies, the crucial items of this general formula are the depreciation cost and the reasonable investor return. Both of these costs commonly are measured in terms of some property valuation. Consequently the crux of earnings regulation, as it is commonly practiced in this country, is the valuation of public utility property. Either the Supreme Court, the legislatures, or the commissions choose a property valuation standard for earnings regulation. This is not an easy task. A standard of fair valuation of property suffices for general purposes. Yet it is not a specific standard; it does not determine an exact property value with which the depreciation cost and the investor return can be measured.

Both the commissions and companies admit that the values of the existing utility plants are the basis for depreciation cost and reasonable-return measurements. But they rarely agree on the way the plant values should be measured. For many years their contrary views created such a costly and senseless controversy that all else in utility regulation was subordinated to the property-valuation question. Throughout the controversy the commissions persistently believed that the original cost or the prudent investment of property was the right valuation. (Until recent years the original cost of property was always thought of as the investment cost of the present company, not the cost to the first public utility firm.) On the other hand, the utility companies, wishing to protect the earnings that they were receiving, thought the reproduction cost was the proper measure of the fair property value. For nearly a half century the Supreme Court defined fair value in a vague way: it was derived by a consideration of an original-cost valuation and a reproduction-cost valuation. This idea of fair value took account of both sides of the valuation controversy; the fair value of utility property was determined by giving "consideration"—some unexplained consideration—to both original-cost and reproduction-cost valuations of property. No one knew just what the fair value of any company's property was. And since only the Supreme Court could make an authoritative determination of any fair property value, the utility companies were encouraged to appeal to the courts rather than to submit to commission regulation. Wishing to avoid litigation, some commissions resorted to a "keep-the-peace" formula of earnings regulation,[23] and did not eliminate all excessive earnings.

During the Second World War the Supreme Court changed the meaning of fair property value, and gave commissions more authority over the process of earnings control. In the Hope Natural Gas decision in 1944 the Court said, "If the total effect of the rate order cannot be said to be unjust and unreasonable, judicial inquiry . . . is at an end."[24] The attention of the Supreme Court finally was focused on earnings, not the property valuation. A choice of the regulatory method, including the fair property valuation, was left to the commissions. Forsaking attention to regulatory methods altogether, the Court did not say that commissions should consider any property valuation. But commissions do base the measurement of the fair return on some property valuation, usually the first original cost or investment cost of property that they can determine readily from accounting records. Now the semiofficial rule of earnings regulation is this: a reasonable rate of return on either the first original cost or the investment cost of useful property.

The reasonable return of a utility company is not determined altogether, of course, by one or more property valuations. Even if the property valuation is the central legal fact in the common American pattern of earnings regulation, the valuation must be multiplied by a rate of return before the reasonable return finally is determined. Since the valuation of property and the rate return are complementary in earnings regulation, the rate of return can be as important as the property valuation. Yet the rate of return has not been the center of an unsettled legal controversy. While the Supreme Court has had much to say on the fair valuation of property, it has done little reasoning about the fair rate of return. This omission can be an advantage for an alert commission: the commission can compensate for high property valuations by paring down the rates of return. Yet the commissions, like the Supreme Court, ordinarily do not stress the measurement of fair rates of return.

Depreciation cost can be as significant as the reasonable return in earnings regulation. The accounting for depreciation affects earnings regulation in two ways: as a current (usually annual) cost of operations, and as a deduction from the fair property value to determine the net property value on which a utility company receives a reasonable rate of return. Thinking of depreciation as a measurable technical condition, the managers and engineers of utility companies often define it as the decline in operating efficiency. If the plant of a company can produce as much service this year as it did last year, there is no depreciation cost for the year. An inevitable deterioration and obsolescence of a public utility plant is ignored until it can be measured in physical terms—or until the depreciating equipment is retired. But this idea of depreciation, like the retirement accounting with which it often is tied up, is not acceptable to commissions. Now the familiar accounting concept of depreciation, the inevitable "consumption" of a plant investment for any reason, is used in earnings regulation. Accountants do not say that they know exactly how much plant investment is "used up" during each year. Instead, they recognize the limited service life of equipment, make periodic depreciation charges throughout the estimated life of property, and plan to recover the investment in depreciating equipment. A sort of practical arbitrariness, rather than scientific measurement, controls the annual depreciation charges and the recovery of depreciating plant investments.

Computation of the annual depreciation charges does not disturb earnings regulation today. But the depreciation deduction from the aggregate property valuation, the accrued depreciation as it is commonly called by accountants, still is a controversial part of earnings regulation. Measurement of accrued depreciation is a special property-valuation problem; it is quite as perplexing to commissioners as the companies' insistence on reproduction-cost valuations once was. Adhering to their physical-efficiency definition of depreciation, utility companies want to deduct only the depreciation that their engineers can measure. They call it the "observed" depreciation, the depreciation an engineer can see with his expert eye. On the other hand, the commissions prefer to deduct the depreciation reserves—the cumulative depreciation charges with which the companies recover some or all of the plant investments. Regulators argue that, since consumers contribute revenue to cover the depreciation expenses, deduction of the depreciation reserves avoids double charges to buyers. For a long time the Supreme Court approved the deduction of observed depreciation. After 1930 the Court relented somewhat in its decisions, and allowed the deduction of more than the observed depreciation of utility-company engineers. Sometime the Court may grant more concessions to the commissions—even explicit authority to deduct the depreciation reserves as reasonable property values are determined.

Past, Present, and Future. A commission investigation deals mainly with the current earnings. Trying to determine whether prices should be increased, decreased, or left alone, the commission wants to know whether the company now receives a deficient, excessive, or reasonable return. First, the total reasonable costs are summed up. These generally are the costs of the current year; regulators make allowances now and then for distinct upward or downward trends of costs, but they commonly prefer to stick to immediate data. Allowable operating expenses, the depreciation cost, and a reasonable return for the present investors constitute the total cost that fixes the limit of the reasonable total revenue. Next, before the total revenue and reasonable total cost can be equated, the commissioners must consider the demand of consumers. Simplifying the demand measurements, they usually assume that the current sales will be made in future years. Even if the prices are reduced or are increased, they still assume commonly that the sales for a current year are the future sales with the new prices. Finding a situation where the current reasonable cost is less than the current total revenue, a commission reduces the prices so that cost and revenue seem to be equal or nearly equal. Seeing an opposite condition where the reasonable total cost is above the total revenue, it increases the prices and intends to equate the cost and revenue in the next operating period.

Regulators fix prices for future sales. To determine the reasonable earnings of future operations, they do not try to predict the future cost and demand conditions; these predictions seem too speculative and difficult to them. Preferring a more convenient solution, they use current cost and revenue facts and disregard possible changes in production and selling conditions. Yet cost conditions are likely to change from year to year; wage, raw-material, plant-maintenance, and tax costs can increase or decrease shortly after a commission decides what is the reasonable total cost for a company. Demand changes are common for most commodities. Even if no one knows precisely how much utility service can be sold at various prices during the next five or ten years, anyone can expect some changes in possible sales at the various prices. A fixed demand for utility service may be a convenient regulatory assumption, but it is an improbable fact. Sales commonly change, too, as the prices increase or decrease. Given time to adjust their consumption habits to new prices, consumers usually increase their purchases as the prices decrease; they may even increase their total expenditures for public utility service. Using the old sales to measure sales at new prices, a commission assumes that the buyers have a perfectly inelastic demand; but all consumers are not completely indifferent to price changes.

Commissions cannot be certain that they choose reasonable prices for companies. Using the available facts, the regulators can plan reasonable prices and earnings for the future operating periods. But the planned revenue and earnings are not certain to be the real, experienced revenue and earnings. After a commission fixes a company's prices, the production costs may increase or the consumer demand may decrease; the company now obtains less than the reasonable return that the commission planned for it. On the other hand, the demand may increase or production costs may be reduced as a result of technical innovations, reductions of taxes, and lower raw material prices and wage rates; now the company receives earnings that are above the planned, reasonable earnings. Regulating in a dynamic society, a commission usually can expect the planned, reasonable returns to be above or below the real, experienced returns.

If they are willing to change the traditional form of earnings control, commissions can bring the actual returns and planned (reasonable) returns closer together. They cannot control the changes in demand and cost conditions, but they can make some revisions of regulatory procedure. At least the Supreme Court does not say that the procedure of earnings control must stay firmly fixed in its present grooves. One possible change is more frequent investigation of earnings. The costs and revenue of each company can be examined carefully every year or every two or three years, not every five or ten years. Investigations can be made as frequently as significant demand and cost changes occur. If they are subjected to frequent inquiries, companies cannot keep excess returns for a long time.

Another choice is continuous earnings control. The past, present, and planned earnings are integrated into a whole, continuous process of profit control. To give continuity to the regulation, the utility firms cannot claim that the actual earnings are their private property; excess earnings can be taken away from them. On the contrary, commissions cannot disregard deficiencies in the actual returns, telling the companies to be satisfied with what they can get at the prescribed prices. Any excesses in actual returns are recaptured from the companies; any deficiencies are restored. When a commission prescribes what seem to be reasonable prices and the private firm obtains more than a reasonable return as a result of favorable demand and cost changes, the excess is used to reduce future prices. The regulators turn the past and current excesses into lower prices as new earnings decisions are made. But when a company obtains a lower return than the reasonable return that the commission planned for it, the deficiency is restored out of future revenue. A utility company is allowed a reasonable amount of earnings, though some firms (e.g., street railways) may not be able to get the earnings with any prices. Using continuous earnings control, a commission does not worry about imperfect demand and cost predictions. The uncertainties of revenue and cost conditions are balanced from one operating period to another, because the past, present, and planned returns are tied together.

Commissions rarely have an interest in continuous earnings control. When they see differences between reasonable returns and actual returns, regulators may be interested in earnings investigations; the differences suggest a need for price reductions. But such differences do not encourage recapture of excess returns and restoration of return deficiencies. After reasonable prices and earnings are fixed, the companies take the chances of demand and cost changes until other prices and earnings are prescribed. Commissions apparently are satisfied with the Supreme Court's views in the New York Telephone and the Galveston Electric cases. Deciding the New York Telephone case, the Court said, "The revenue paid by the customers for service belongs to the company."[25] And in the Galveston case the Court did not approve the consideration of past losses as reasonable prices were fixed.[26] Although these judicial views did not rule out any plan of continuous earnings control, the commissions apparently were contented. Even after the Court said in the Hope case that ". . . it is the result reached, not the method employed, which is controlling,"[27] the regulators still relied on current facts and did not try to bring the planned and actual returns closer together. These men are not yet ready to unite the past, present, and planned earnings into a single regulatory procedure.

Demand and Cost Studies. Commissions usually do not study the demand behavior of consumers, new markets for utility services, or variations in production costs as the output changes. Examining the consumer demand, regulators can learn something about the quantities of service that can be sold at prices other than the existing prices. If they have some knowledge of the shapes of demand curves, commissioners can make allowances for sales changes as prices change. Yet the elasticity of demand, expressing the relationship between prices and consumer purchases, is not studied. Neither the term "elasticity of demand" nor any synonymous term is found in the administrative or legal language of earnings control. Commissions seem to be satisfied with the convenient idea that the old sales will continue at the new prices. To avoid solutions for the possible relations between prices and sales, they assume that price changes do not have any effect on consumption.

New markets can provide additional earnings for price reductions in old markets. Looking toward additional revenue and economical use of the available plant capacity, commissions can justify more studies of public utility markets. Perhaps they can find profitable service areas and uses that the conservative managers of private companies overlook. Yet the regulators do not search for more sales, or follow closely the market-expansion programs of the firms. Studies and developments of new markets are left to the companies. Similarly the commissions rarely make cost studies for different industries, companies, and markets. Total costs of production apparently are expected to increase, for instance, as the output is enlarged in connection with price reductions or demand increases, but these or other cost changes are not essential facts in the current regulatory pattern. Commissions are willing to wait for output and cost changes. Meanwhile, they are satisfied to use the current total costs as reliable, factual measures of the future costs.

Optimum Plant. Neither the courts nor the commissions give much attention to the optimum choice of a utility plant, the existing plant being commonly considered efficient. Commissions usually do not examine the past investment decisions of the companies; nor do they study the possible limits of new investments. They leave these decisions to the companies. Commissions have authority to examine investment decisions, and to allow returns and depreciation cost on no more than a wisely chosen and efficient plant. The basic legal rule of earnings control specifies that a company can receive a fair return on the fair value of *used and useful* property. Yet commissions give only limited attention to the measurement of used and useful property. Controversies about the meaning of used and useful property rarely come to the Supreme Court; the determination of what is used and useful property is not a critical point in any case. In most cases the used and useful property is no issue at all; a reasonable property value is determined for the existing plant.

Some obsolete property is eliminated from rate-base inventories. Even so, the commissions usually are generous; they eliminate the property that is abandoned completely, but allow a return on stand-by property. For every property item that commissions eliminate from the used and useful inventories, companies probably receive returns on dozens of obsolete property items. Nor do commissions and courts study the sizes of utility plants, and try to determine the most efficient plants under different demand and cost conditions. "Overinvestment" and "underinvestment" are not in the vocabularies of commissioners and jurists. Even if a company experiences a large decrease in the demand for its services and consequently has much unused plant capacity, commissions rarely scale down the amount of property on which the company is entitled to a return. Even though a substantial part of a plant is not used for a long time, it still may be classed as used and useful property. Commissions look at the financial facts of companies, not the efficiency of plants. They wish to maintain the credit standings, and to give support to the existing investment values of utility companies.

THE RATE-MAKING UNIT

A single company often has more than one geographic unit for the purpose of earnings regulation. Each city or metropolitan area can be a separate unit for earnings and price control. In other instances a larger area, embracing many towns, can be treated as a rate-making unit. A variety of rate-making units are used by companies and commissions. The municipality is a traditional unit, for most utility companies started to operate as local enterprises. In the case of water, urban transportation, telephone, and manufactured gas service the city still is the common rate-making unit. Even the reasonable earnings of electric companies sometimes are determined for single communities. When electric firms serve rural customers as well as urban communities, commissions often allow them to treat the rural customers as a separate group for rate-making purposes.[28] And when a company has separate plants, each town can be treated as a separate unit in earnings regulation.[29]

At times a whole metropolitan area is the geographic unit in earnings regulation. This unit is used frequently for electric service, occasionally for telephone and gas service, and infrequently for street railway and water service. When a single electric or telephone company serves all or most of a metropolitan area, the company's plant, particularly in the case of electric companies, usually is constructed to serve the whole area. Service production is integrated for the hub city and its suburbs. This is a case of joint service production. Since the joint costs of production cannot be allocated easily or conclusively to each city, the metropolitan area is the preferable unit for the regulator. Selection of this unit frees the company and commission from buyer complaints against price differentiation between adjacent cities.[30] Telephone companies often are willing to risk the charge of price discrimination, however, rather than fix uniform telephone charges throughout an extensive metropolitan area. And commissions approve toll telephone charges to and from separate cities in a metropolitan area.[31] If a telephone company serves all or a large part of a state, the reasonable costs and reasonable earnings may be calculated for the total state operations rather than the separate operations of each city. Bell companies may not object to aggregate measures of costs and earnings, but they still seek to differentiate prices according to the sizes of cities.[32] They maintain the right to charge more for telephone service in the large cities, because there the value of the service seems to be higher.

Even in these days of superpower systems, widespread interconnection of telephone plants, and long-distance transmission of natural gas, many commissions still hold out some distinctive earnings control for single communities. But a shift toward larger geographic units in earnings regulation and toward more uniformity of utility prices is evident. Geographic uniformity of utility prices is affected by large-scale production of service, the difficulty of cost allocations to separate communities, and consumer objections to price differences between communities. Elimination of geographic price differentials is most notable in the electric industry. In 1935 the Federal Power Commission found that 2,035 communities received electric service from companies that had uniform residential rates.[33]

Here and there state-wide uniformity is possible because a single electric company serves most of the state. The Montana Power Company is such a system. And in the South, which has more geographic uniformity of electric prices than any other section of the country, the Alabama Power Company, the Georgia Power Company, and the Mississippi Power Company have nearly company-wide uniformity of residential electric rates. Some electric companies divide their markets into a few groups of residential buyers. Many of them have less than five groups, and the majority have less than ten groups.[34] In each group the price of residential electric service is uniform, of course, for all buyers. Geographic differentiation of electric rates still is common throughout the nation. Yet the geographic differentials for electricity, particularly within the limits of the markets of individual companies, are not nearly so numerous as they once were.

The Position of the Supreme Court. The Supreme Court has not yet prescribed rules for the choice of rate-making units. Geographic differentiation of utility prices has not been, in fact, an important legal question in public utility regulation. The choice of a geographic unit for earnings control was presented to the Supreme Court in the Wabash case of 1933.[35] A group of electricity consumers in an Indiana city argued that local conditions of service, as distinguished from whole-system conditions, should determine the local price of service. These consumers naturally wanted a lower electric rate than the system-wide rate. Relying on the statutory conditions of Indiana regulation, the Supreme Court approved a separate earnings determination and a separate price for the city. Fixing no absolute rule and standing ready to consider the facts of each case, the Court said,

> Normally, the unit for rate making purposes, we may assume, would be the entire interconnected operating property of a utility used and useful for the convenience of the public in the territory served, without regard to particular groups of consumers or local subdivisions. But conditions may be such as to require or permit the fixing of a smaller unit.[36]

Reasons for Uniform Pricing. When reasonable earnings are determined for all the operations of a company and the same prices are charged in all communities, the company is relieved of complaints against price differentiation, commissions can fix prices readily, and the limits of service may be expanded.[37] Company-wide uniformity of prices eliminates trouble with rate comparisons. Company officials no longer need to explain why some community prices are higher than others. And companies also realize some cost economies from uniform pricing: billing costs can be reduced, rate departments study the revenue of a few rate schedules instead of many schedules, and the regulatory expenditures of a company are concentrated on a few large investigations instead of many small rate cases. Commission control of earnings and prices, too, is helped by uniform pricing. Since an earnings investigation covers all the operations of a company, the commission does not make a separate earnings and price measurement for each community. Like the company, the commission realizes some economies from large rate-making units.

Some cost-allocation problems are avoided by uniform pricing.[38] If a single generating station or gas pipe line is built to serve a number of towns, there is a condition of joint production. The single electric station or gas line, instead of separate plants or lines for each town, is built because production economies can be realized. These are economies of composite output, not those of separable parts of the total output. A large hydro- or steam-generating plant produces electricity economically for several towns as a whole, not for each town as a separate unit. Similarly the managerial salaries, general repairs, taxes, maintenance of a central office, and other general costs of service are costs of producing the whole service output. These joint costs of electric or natural gas service cannot be allocated to separate communities except in an arbitrary manner. But when several towns are put together for earnings and price control, these problems of cost allocation vanish.

Since they are closer to the source of utility service, some buyers argue that they should receive lower rates than others. This is a common argument of electricity consumers. The buyers who are closest to the generating station believe that, since transmission costs of their electricity must be close to nothing, they ought to have lower rates than the buyers who are farther away from the station. They want the advantages of their location. This argument disregards the reasons why the company managers choose the production sites. When the company chooses a plant location, it is guided by the prospective production economies. It chooses between steam and hydro generation of electricity, and between a number of alternative locations for either steam or hydro stations. It is simply a coincidence, then, that some buyers happen to be closer than others to the source of service. At any rate, the utility plants are built to serve a group of buyers, not to serve buyers one by one.

Uniform pricing affects both the distribution of utility services and the total output of the services. When a company sells service at the same prices in all communities, the buyers in small towns usually get price reductions at the expense of the city buyers. Either the small-town prices are reduced more than city prices as uniform pricing goes into effect, or later the urban service provides most of the excess earnings with which all rates can be reduced. An expansion of the intensive margin of service is sacrificed so that the extensive margin of service can be enlarged. Since the urban prices are higher than they are with price differentials, consumption of service is restricted in the cities. In the rural areas, where the prices are lower than they are with price differentials, more families purchase service. The consumption of service becomes more nearly uniform throughout the uniform price area.* Yet the total consumption of service is less with uniform price schedules than with geographic price differentials. This is true because a uniform price policy ignores the cost differentials—the differences in production as well as transmission costs—between localities. When enlargements in output are sought in the high-cost areas of service, a limitation is put on future price reductions. When price reductions are restricted, output expansion necessarily is limited.

* Uniform pricing can be a factor in urban decentralization of population. Elimination of geographic price differentials for telephone, gas, and electric service can induce more families with moderate or small incomes to move to outlying suburban areas, though it is true that other factors, particularly the automobile and highways, have more influence.

Chapter 11

Control of Expenditures

OPERATING EXPENSES make up most of the costs of utility service; they commonly are a half to three-quarters of the total costs. By size, then, they are more significant than the fair return and depreciation cost. Yet, even if they are the largest part of total costs, they receive far less regulatory attention than is given to the fair return and depreciation expense. Despite a general tightening of regulation after 1930, utility companies still are trusted to be intelligent and efficient in most of their expenditures. Commissions rarely question their expenditures for plant maintenance, raw materials, and labor. But they do distinguish now between expenditures for investor interests and the costs of the consumers' service. Payments to affiliated companies for goods or services are closely circumscribed. And expenses for such purposes as advertising, rate investigations and litigation, or public relations are examined quite closely to determine what parts should be charged to the buyers. Taxes of utility companies, which generally are classed as costs of service, are special regulatory problems. Here the conflict, particularly as the tax bills of utility companies grow, is between the regulators who seek rate reductions and the tax authorities who seek more government revenue.

THE GENERAL LEGAL VIEWS

Some commission control of utility-company expenditures always was approved by the courts. In the early days of regulation the Supreme Court, not forgetting its "supreme duty" to protect the vested rights of property owners, concluded that legislative power was not ". . . subservient to the discretion of any railroad corporation which may, by exorbitant and unreasonable salaries, or in some other improper way, transfer its earnings into what it is pleased to call 'operating expenses.' "[1] For a time, however, the decision of the Supreme Court in the Southwestern Bell case of 1923 restricted the scope of expenditure control.[2] At this time the holding company, AT&T, provided some equipment and performed some managerial services for the Bell companies, and the subsidiaries paid 4½ per cent of their gross revenue to AT&T. The Missouri Commission did not include these expenditures among the costs of service as it fixed the Southwestern Bell rates. Overruling the commission and quoting a decision of the Illinois Supreme Court,[3] the Court said,

> The Commission is not the financial manager of the corporation, and it is not empowered to substitute its judgment for that of the directors of the corporation; nor can it ignore items charged by the utility as operating expenses unless there is an abuse of discretion in that regard by the corporate officers.[4]

Judged by the Southwestern Bell decision, payments for affiliated company services were costs of service unless the commissions could prove an "abuse of discretion" by the affiliated company managers. Even if the payments were determined and collected by the same company and even if they were not subject to any competitive bidding, the Court still held that they were costs of utility service. The Southwestern Bell rule was revised in the Illinois Bell decision of 1930.[5] The Court admitted that commissions could examine the cost of intra-system services and equipment purchases of Bell companies, though it did not say how their reasonable costs should be determined. A similar view was expressed a few years later in the Western Distributing case.[6] Because an affiliated transmission company sold natural gas to the Western Distributing Company and arm's-length dealing did not exist between the buyer and seller, the Court upheld the demand of the commission for evidence of the gas transmission costs. Customers were not expected to cover whatever expenditures the companies wished to make. At least they did not need to pay prices that covered any payments a firm made to an affiliated company.

As commissions fix the reasonable costs of service, the Supreme Court allows them to reject other expenditures than the payments to affiliated companies. They can reject imprudent expenditures. A firm cannot spend freely and expect all expenditures to be counted as necessary or reasonable costs. If the expenses are to be covered by consumer revenue, the company must be reasonably efficient, spending no more than sensible sums for service production. Commissions can question the judgment as well as the integrity of utility-company managers. This is the view of the Supreme Court in the Acker case. When this case, which involved public utility control of Chicago stockyard charges, was decided in 1936, the Court approved the regulator's (Secretary of Agriculture's) rejection of some marketing costs. Speaking for the Court, Justice Roberts said,

> The contention is that the amount to be expended for these purposes is purely a question of managerial judgment. But this overlooks the consideration that

the charge is for a public service, and regulation cannot be frustrated by a requirement that the rate be made to compensate extravagant or unnecessary costs for these or any purposes.[7]

COMMISSION CONTROL

Commissions can undertake direct control of the reasonable costs of utility-company services. As companies make expenditures, commissions can warn them that certain expenditures are not reasonable costs of service. Or, putting accounting regulations and expenditure controls together, they can prescribe general rules for expenditures. This, however, is not the common practice of commissions; most of them do not prescribe the expenditures a company can or cannot make. Yet the SEC fixes the service charges that holding-company systems can collect from their operating companies. Similarly, the Federal Power Commission regulates the wholesale charges for interstate electricity and natural gas sales, and thereby protects distributing companies and consumers against unreasonable costs of service. And the Oregon, Washington, and Pennsylvania Commissions have some control of the budgets of utility companies; they scrutinize proposed expenditures on officer salaries, donations, political contributions, advertising, and management services or equipment purchases from affiliated companies. These budgetary controls or even closer budgetary controls of all expenses, accompanied by studies of efficient management, are something that all alert commissions can use.

Most state commissions do not restrict expenditures as they are made. Company managers and directors determine the expenditure policies; then, after earnings and price investigations are ordered, the commissions usually separate the reasonable and unreasonable costs of service. At the time of a rate investigation the commission studies the past expenditures of the company. Some of them are counted as reasonable costs of operations, as charges to be covered by the revenue that buyers are expected to contribute; others are eliminated from the regulatory measure of service costs. For the most part this procedure is a selective sort of expenditure control; a few kinds of costs, some of which are discussed in the remainder of this chapter, are studied by the commission, but the bulk of the costs, such as raw material and labor expenses, are not examined. A few commissions, notably those with rate research divisions, make regular studies of the behavior of all costs. Every year the Wisconsin Commission computes cost ratios for each company under its supervision. Likewise, the Federal Power Commission summarizes the costs of most electric companies in the country.[8] Comparing the operating expenses of many companies, the Power Commission hopes to encourage cost economies by the high-cost companies. Yet neither the Wisconsin Commission, the Power Commission, nor any other commission formulates general standards of expenditure efficiency.

Rate-case Expense. For many years the utility companies charged their costs of regulation—their costs of gathering evidence to combat commission regulation as well as those of maintaining accounting systems—to buyers. Special as well as ordinary regulatory costs were included in the reasonable costs of service. If a firm undertook expensive studies of property valuation or tried to obstruct earnings and price reductions with other factual studies or legal activity, the commission was expected to reimburse the company out of future revenue for these "necessary" costs. If the company appealed a commission decision to the courts, the costs of litigation, too, were treated as reasonable costs of operation. Consequently the buyers of utility service paid the expenditures that companies incurred to prevent price reductions. And prospering utility companies had a "sure thing": even though earnings investigations went against them, they still could use the excessive earnings to cover the costs of investigations and litigation. They could combat regulation and charge the expenses, win or lose, to the customers.

After the public pressure for rate reductions developed during the thirties, commissions started to examine the reasonableness of the regulatory expenditures of companies. This problem soon was placed before the Supreme Court. When the Supreme Court decided the West Ohio case, it said that a utility company should be reimbursed for expenditures that were incurred as the company case was presented to the commission.[9] Although it did not discuss what were and what were not permissible expenditures, the Court did say that "a different case would be here if the company's complaint had been unfounded, or if the cost of the proceeding had been swollen by untenable objections."[10] In the Driscoll case, which was decided in 1939, the Court encountered similar conditions.[11] In this case the Pennsylvania Commission refused to include regulatory costs among the reasonable costs of service; it eliminated the costs of defending the "obviously excessive" rates. Yet the Court, revising its West Ohio opinion somewhat, said, "Even where the rates in effect are excessive, . . . we are of the view that the utility should be allowed its fair and proper expenses for presenting its side to the commission."[12] In the Driscoll case the Court approved amortization of the rate-case expenses out of future earnings, and allowed the company to charge off the expenses over a ten-year period. After the Supreme Court decided the Driscoll case, commissions commonly spread the amortization of rate-case costs over five-year or ten-year periods.[13]

The West Ohio and Driscoll decisions do not settle the status of all regulatory expenses. Some costs of commission regulation certainly can be counted among the reasonable costs of service and be paid out of customer revenue. Complying with commission orders, companies incur expenses that unquestionably are parts of the reasonable costs. The costs of accounting practices, special accounting revisions or reports, original-cost valuations of assets, and continuing property records are examples of legitimate costs.[14] And when commissions undertake investigations of price, service, financial, and other matters, the companies incur more proper costs of service. Some costs of evidence, counsel, and expert witnesses are service costs; they are the costs of fair investigations and fair hearings. But companies should not expect reimbursement of all conceivable regulatory expenses. Undertaking extensive property valuations, hiring expensive counsel and numerous experts, and presenting long and detailed reports, the companies can delay commission decisions or try to overwhelm the commissioners with facts and knowledge. These expenses naturally seem reasonable to the companies, because they are incurred to protect the earnings and managerial rights. Taking another view of the costs, consumers are unwilling to pay for the elaborate defenses of private interests. Some company costs of regulation can be classed, they believe, as investor costs rather than reasonable service costs. No clear and final definition can be given, however, for a reasonable regulatory expense. Again so much turns on the meaning of "reasonable."

The Supreme Court does not say how the company costs in court cases should be treated. In the Driscoll decision the Court did not pass on these costs, saying that "we do not refer to expense of litigation in the courts." A company's costs of court litigation, which are incurred as commission decisions are appealed to the courts, cannot be classed altogether as investor costs. Some litigation expenses are reasonable costs of service, because utility companies cannot be denied payments for reasonable hearings and trials. A commission can practice ruthless or shortsighted regulation, reducing earnings and prices merely because the buyers wish lower rates. If so, the company expenses of judicial review are rightly amortized out of the future earnings. A firm, on the other hand, may appeal any Commission decision to the courts, because lawyers do not think a case is lost until every legal recourse is exhausted. Disregarding the reasonableness of a commission decision, the company wants to delay enforcement of the commission order and hopes for a more lenient court decision. Under these conditions the costs of litigation are not reasonable costs of service. The motives of the companies and commissions, which naturally are not openly announced, are the crucial facts.

Wages and Salaries. Commissions do not try to control ordinary wage rates, or to measure the efficiency of utility-company laborers.[15] If wage rates increase and a company does not earn a reasonable return, it can ask for and get a price increase. But while the wages of laborers, clerks, engineers, and minor officials are subject to labor market conditions and labor union policies, the salaries of important company officials sometimes are determined by the officials themselves. This is true when company officials also are important company stockholders. Being both officials and influential stockholders, they can pay themselves exorbitant salaries. They can turn excessive earnings into high salaries, and can get some of the earnings that otherwise are turned into price reductions.

Most commissions do not question the reasonableness of officers' salaries. Only a few commissions ever refuse to count all managerial salaries in the total reasonable costs of service. The California Commission thought that the officer salaries of one company were too high,[16] rejecting the argument that managerial salaries made up an insignificant part of total service costs, and had only a small effect on prices; it pointed out how any cost, considered alone, usually was a small part of total costs. A New York company asserted that its leading executive deserved a large salary because he developed the company and effected remarkable cost economies. Comparing this company with other New York companies and finding no evidence of a notable managerial efficiency, the New York Commission reduced the cost allowance for executive salaries.[17] And the Utah Commission ordered salary adjustments for a small company when managerial salaries and director fees were more than 30 per cent of total operating expenses.[18] Other commissions occasionally ask the firms to prove the reasonableness of managerial salaries, question the stability of the salaries during a severe depression, or compare utility-company salaries with nonutility salaries.[19] But these are not the regulatory views of all commissions. The Michigan Commission apparently expresses the common view. Although the salaries of the officers of a company seemed to be "pretty large," it decided that the directors were the ". . . best judges of the value of executive officers . . . , both to the utility and to the public." [20]

Political Expenditures. In past years utility companies frequently spent money to influence voters and legislators. During the twenties, when holding companies were maturing and all utility firms, except street railway systems, were expanding, these expenditures were large. In nearly every state an information bureau was organized and supported by the utility companies. These bureaus lobbied against regulatory legislation, influenced public opinion through newspapers and magazines, maintained a public speaking service, sent many pamphlets to school children and influential persons, and even rewarded a few college teachers for their respectful attitudes toward the private utility firms. Individual companies, too, often have spent considerable sums on political activities. When local governments have planned municipal utility plants, the private companies, fearing either the loss of profitable plants or competition with public plants, have spent freely to influence the local elections. Regular company employees have been used in the campaigns against municipal plants. And new employees, including specialists in public-opinion campaigns, have been hired to fight against the municipal ownership proposals. These expenditures, which so obviously have been beneficial to the investors, have not been reasonable or necessary costs of public utility services.

Utility companies always spend something to maintain their political connections, and to influence public opinion. They advertise about their own efficiency, their excellent service, their heroic accomplishments. This advertising is expressed in such a way that private ownership and private managers seem to be superior, and commission regulation and public plants seem to be inferior. All costs of public relations ought to be classed as investor costs; none of them should be included in the reasonable costs of service. If the companies wish to influence consumer opinions, they should pay the cost of the changes, and the consumers should make their contribution when they listen to the chatter and self-praise of utility companies. Donations, charitable contributions, and similar payments are not easily classified, though some part of them seems to be a public-relations cost. Insofar as donations and charitable contributions insulate a company against adverse commission and legislative action, they can be omitted from the reasonable service costs. Yet the public-relations purpose of the contributions cannot be identified readily. The motives of the managers, as they make the contributions, can be unselfish. Consequently the donations and contributions of utility companies can be classed as necessary service costs, except where convincing evidence of ulterior motives can be presented.

Selling Costs. Searching aggressively for new customers and larger sales, many utility companies, particularly the large electric and gas firms, do not stint on sales-promotion expenses. They do not build their plants and wait for buyers to come to them. Instead, they promote sales. They spend freely on advertising and salesmanship, telling domestic buyers about the economies and conveniences of utility services and the wisdom of larger purchases. These selling costs, which are expected to increase the demand for service, are classed among the reasonable costs by the Supreme Court. When Justice Cardozo wrote the majority opinion of the West Ohio case, he said,

> A business never stands still. It either grows or decays. Within the limits of reason, advertising or development expenses to foster normal growth are legitimate charges upon income for rate purposes. . . .[21]

The Court relies on the good faith of private company managers. Unless there is evidence of imprudent selling expenses, the Court does not substitute its judgment for the managerial decisions. This is the view, too, of most state commissions.[22]

Consumers can gain something from expenditures on advertising and salesmanship. Some of these expenditures, perhaps most of them, are expected to lead to more intensive use of the existing utility plants and to more net earnings. These increases in earnings can be turned into price reductions for all buyers. At least frequent and intelligent investigations can convert the new earnings into rate reductions. Part of the selling costs, however, do not lead to increases in earnings, and are not beneficial to the buyers. Some radio, newspaper, and periodical advertising by utility firms increases the expenses, but contributes nothing to consumer services. This advertising is supposed to improve the public relations of the companies. Utility firms often buy advertising space in all the newspapers of their market area. This practice keeps some newspapers on the side of the companies and restricts the attacks of others; a favorable or restrained press helps the firms during regulatory or public-ownership controversies.[23] And radio advertising gives the buyers entertainment, not price and service changes; it serves the interests of the investors and managers. Consequently the commissions can rightly refuse to charge all advertising or ostensible selling costs to the buyers. Some commissions do not include all advertising expenditures among the reasonable service costs;[24] they allow no more than the necessary, productive costs of service.

The costs of appliance sales usually are not counted as parts of the new business expenses. The merchandising of appliances commonly is treated as a nonutility business. Some commissions, observing great increases in the appliance sales of gas and electric companies, began to take this position before 1930.[25] Later, when accounting systems were revised in the thirties, the expense and revenue accounts for appliance business were separated from the other expense and revenue accounts of gas and electric firms. Today, then, commissions often set the costs of appliance sales apart from other selling costs. The costs of appliance advertising are kept separate from other advertising costs. And the salaries of employees, who devote part of their time to appliance selling, must be allocated partly to the appliance business.

Appliance selling is one way to get new business. When losses are incurred in handling appliances, they do not seem to be clearly distinguishable from expenditures for advertising and general salesmanship. If more appliances are sold, the demand, sales, and net earnings of the company may increase quite as much as if general sales promotion is carried on. Furthermore, the expansion of electric and gas sales, particularly among domestic customers, usually is associated with appliance sales. Before domestic consumers can buy more electricity or gas, they often must buy more stoves, refrigerators, and other equipment. Buyers obviously cannot purchase electricity or gas for hot-water heating, for instance, unless they have hot-water heaters. Perhaps they do not buy more water heaters or other appliances because the appliance prices are too high. If this is true, a reduction of appliance prices can increase the sales of electricity or gas. These losses are new business expenses. And the losses, like general advertising expenditures, can be covered by the additional earnings that the company obtains from the demand increases. Appliance sales can be sensibly classed as a part of public utility operations.

If losses on appliances can be reasonably counted among the new business expenses, why do the commissions commonly segregate appliance selling from other utility business? Perhaps regulators do not see appliance selling as a kind of sales promotion. They may see only the sale of a nonutility commodity, the appliance, rather than the sale of more utility service. And the commissions may dislike the discriminatory nature of some appliance salesmanship: the reduction of appliance prices and free appliance services for only part of the consumers. Some consumers pay the regular retail prices for equipment; others buy their appliances for less than the retail prices. Commissions also listen to the complaints of the nonutility dealers in electric and gas appliances. Before the regulatory policy about these sales was revised in the thirties, independent dealers objected to what they called the unfair competitive advantages of the utility companies. Because electric and gas companies could write off their appliance losses to general utility operations, had large financial resources, and obtained quantity discounts from manufacturers, the independent dealers said that the selling conditions were unduly favorable to the utility companies.[26] The independent dealers desired better opportunities for profits. Consequently many commissions classed the appliance selling as nonutility business, forgot the consumers' interest in low-priced appliances as well as low-priced service, and gave the independent dealers opportunities to make more sales.

Special Customer Services. Electric and gas companies sometimes provide a number of special services for their customers. Some of them give electric bulbs to consumers; others repair appliances for nominal charges. These services help to maintain sales; free bulbs increase the amount of lighting sales, and appliance repairs keep the appliances in use. But part of these costs can be charged to the investors. These services sometimes are managed so that consumer relations are improved. This seems to be true when well-dressed employees, driving well-maintained trucks, deliver light bulbs in a friendly manner, or when a repairman comes quickly to examine your appliance. The companies "give" a service so that the attention of buyers is diverted from price reductions. Some special service costs, like some of the selling or political costs, can be properly treated as investor costs, as expenses of protecting earnings and prices rather than necessary costs of service production. Yet the commissions usually include these expenses in the reasonable service costs, and charge them to the consumers.

Service Charges. Collecting management fees from their operating subsidiaries, holding-company organizations created a special problem in expenditure control. Either the holding company, as in the case of AT&T, or a subsidiary service company negotiated the management contracts and served the operating firms. For accounting, engineering, legal, and financial services the companies paid annual fees which often were fixed percentages of the gross revenue of each company; to get special management services, such as the planning and supervision of construction work, the companies paid additional charges. One question was the usefulness of the services. Holding companies argued, of course, that operating companies lacked the ability to perform the services for themselves. This was not always true. Small companies could use some of the engineering, financial, and legal assistance, but the large operating systems usually were able to stand on their own feet. A larger question was the reasonableness of the charges. Some holding companies exploited their operating subsidiaries; even after the salaries of some holding-company officials and other costs of holding-company operation (including such special items as the research costs of AT&T[27]) were deducted, the management contracts still were sources of large amounts of revenue. Controlling the operating companies and sitting on both sides of the bargaining table, the holding company could fix the charges to its own satisfaction. As the SEC said, "While some of the service fees were earned, there were many more cases where the charges were either exorbitant or completely spurious."[28]

Control of service contracts is exercised by both state and federal commissions. Most of the state commissions have specific authority over the management contracts that are signed by operating companies. Copies of the contracts must be filed with most state commissions. In some states the agreements must be approved by the state commission before they become effective; in other states the contracts are subject to approval or disapproval of the commission after they are filed and are effective. In general, then, the state commissions have authority to prescribe the terms of the service contracts.[29] A state commission can require that the operating firms pay no more than the costs of the management services; operating companies can be required to prove the reasonableness of the charges; and a commission can withhold approval of contracts unless it has access to the service-company records. There are, nevertheless, some obvious limitations of state control of the service charges. State commissions cannot control service companies directly, but must regulate the fees through the payments of the operating companies. Several state commissions, moreover, may control the charges of some service companies or holding companies. Not only do the state commissions duplicate each other's regulation, but also the regulatory procedures are not uniform. After more than a decade of service-charge regulation, the state commissioners still do not have a uniform service contract.[30]

The Federal Communications Commission does not yet have authority to control the service charges of the Bell system. Unless state commissions revise the service contracts as they do in a few states,[31] the Bell operating companies still pay the charges that AT&T chooses; in most states they still pay 1½ per cent of their gross revenue to AT&T.* But the service contracts of gas and electric holding companies are regulated vigorously by the Securities and Exchange Commission. In the Public Utility Act of 1935 the SEC was authorized to require that managerial services "be . . . performed economically and efficiently for the benefit of . . . companies at cost, fairly and equitably allocated among such companies." Contrasted with the state commissions, the SEC undertakes direct and uniform regulation of service contracts. It prescribes a uniform system of accounts for service companies, circumscribes service charges with extensive regulatory rules, and reduces greatly the service-charge payments of operating companies. Indeed, the SEC regulation of service charges overshadows and nearly blots out state-commission regulation of the fees.

The first rule about service charges is a simple one: operating companies shall not pay for services that they do not need. In Missouri the fees are approved when they are necessary for successful operations.[33] When a management company did little more than send out customer bills for a small water system, the Massachusetts Department of Public Utilities could not see a need for the management services that was commensurate with the charges.[34] The New York Commission wants evidence of management contract benefits, and does not approve service fees unless the companies can cite some specific services of the management firm.[35] The SEC expresses the same principle in the following manner:

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* The Washington Department of Public Service believes that the problem of Bell license contracts "is one which cannot finally or satisfactorily be solved by the individual states."[32]

> Each service company should confine itself to functions which the operating subsidiaries cannot perform as efficiently and economically themselves. These services should be limited to services of an "operating nature" as distinguished from managerial, executive, or policy-forming functions.[36]

Next, the commissions press down the service charges until no profits are left in the contracts. To prevent management profits, state commissions[37] and the SEC alike do not approve assessments of service charges as percentages of operating revenues. The service charges are limited instead to the costs of the services.* These costs, which are carefully prescribed by the SEC, are the expenditures of the servicing company, and a "reasonable" return on the "necessary" capital. The necessary capital customarily is the investment cost of service-company assets, plus an allowance for working capital.[39] Outside investments of the service company are not counted. Since the service companies seldom have large investments in fixed property, the costs consist chiefly of service-company expenditures on labor and materials. Before the Second World War began, the SEC pressed down the prices of these services; they were reduced to about 1½ per cent of the gross revenues of operating companies. Unless some of the managerial services are judged to be useless and are eliminated, not many more cost reductions can be realized from service-charge regulation.[40]

The SEC not only measures the actual cost of management services, but also can determine the reasonableness of the service-company expenditures. The Holding Company Act provides for charges ". . . at a reasonable saving to member companies over the cost to such companies of comparable contracts performed by independent companies." This comparative-cost standard is repeated in the general SEC rules for service contracts. In one case the commission made some rough, statistical comparisons of the costs of several service companies.[41] And when some service companies changed their functions and reduced their operating expenses, the SEC scrutinized the revisions.[42] But, apart from the general statutory requirement of reasonable charges, the SEC does not fix any standards of managerial efficiency. The SEC apparently is willing to accept service-company judgments on the wisdom of labor and raw-material expenditures.

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* When a service company sells used equipment to an affiliated company, the SEC says that the "price shall not be more than cost less depreciation." And when the company sells its own products to an affiliated company, the charge must not exceed the price at which the "purchaser might reasonably expect to obtain comparable goods elsewhere, or to furnish them itself. . . ."[38]

A further problem concerns the allocation of service-company costs to operating companies. First, the total costs must be divided between operating and holding companies; next, the expenses of managerial service must be allocated in some way to operating companies. When some persons work for both holding companies and service companies, the SEC does not count all their salaries among the management costs.[43] A solution of this problem calls for a distinction between the functions of the service companies and the holding companies. Holding-company costs are not chargeable to operating companies; service-company costs are. This seems to be the distinction of the SEC: when officers or employees perform managerial services for the entire corporate system, their salaries are charged to the holding company.[44] This distinction reduces the earnings of the electric and gas holding companies. A similar rule is needed for the service charges of the Bell system. If management costs are separated from the AT&T or holding-company costs, state commissions (or the Federal Communications Commissions whenever Congress provides for federal regulation of the telephone license contracts) probably can reduce the contract payments of the Bell companies. The costs of policy-forming services, which are charged to the holding companies under the SEC rule, and some research expenses of Bell Telephone Laboratories[45] apparently make up a considerable part of the AT&T costs that are charged to subsidiaries. One state commission, the Washington Department, distinguished between AT&T costs and management costs, and refused to approve the AT&T charge because it was "fundamentally a stockholders' expense."[46]

The SEC prefers allocations of service charges that are not figured as percentages of the operating-company revenue. About half the costs are allocated on a direct basis; they are allocated according to a time or labor measure of the services that each operating firm receives. The other half of the service costs, which are largely overhead costs, must be allocated with other methods. Some of them are "loaded" on the direct charges. In other cases when the service companies are reorganized into departments, the costs can be allocated according to operating-company use of the departments.[47] The costs of a customer billing department, for example, are allocated in proportion to the number of bills that are prepared for each operating company.[48] Where the departmental organization of the service company is incomplete and where a use basis of allocation cannot be found, some of the overhead service costs are allocated as percentages of operating-company revenue. The SEC approves service-cost allocations in proportion to operating revenues only when no other workable allocation can be devised.

Wholesale Commodity Contracts. When one company sells utility service to another company, a further problem of expenditure control is presented to the commissions. One company generates electricity and sells it to affiliated distribution companies. Or natural gas is produced by one company, transmitted by another, and sold to consumers by a third company in a corporate system. When all the companies are located within a single state, state-commission regulation is not disturbed; the state commission can simultaneously investigate the earnings of two or three companies instead of a single company. But when the electricity or gas moves in interstate commerce, the state regulation of earnings is upset. Applying the judicial rule of the Western Distributing case, a state commission can demand cost evidence for commodity exchanges between affiliated companies. But the state commission does not have direct control of the interstate company.

The Federal Power Commission helps state commissions, and reduces the wholesale charges of electric generating companies that operate in interstate commerce.[49] Regulation of interstate electric sales is an important task of the Power Commission; and it is destined to become more important as the economic limits of electricity transmission are extended.* The Federal Power Commission also regulates the wholesale rates of companies that are engaged in interstate transportation of natural gas. That is the most important function of the Power Commission under the Natural Gas Act of 1938. Within a few years after it began to regulate interstate gas transmission companies, the commission made numerous reductions of wholesale gas rates.[51] Nearly all the long-distance lines, the lines that were built chiefly during the thirties to large Midwestern and Southern markets, felt the effect of this new regulation.[52] Sometimes the state commissions requested a Power Commission investigation; in other cases the commission undertook inquiries on its own initiative. Some companies, trying to cooperate with the Power Commission, accepted conference settlements of their cases.[53] But other companies, such as the Cities Service Gas Company which eventually was ordered to make about a $4,500,000 reduction of its annual earnings, took their chances on formal and more protracted hearings.[54] The Federal Power Commission quickly reduced wholesale gas rates that state commissions either did not or could not reduce. And to be sure that these wholesale rate reductions reached the final consumers of gas, the Power Commission notified the regulators of distributing companies, either the state commissions or local authorities, as each wholesale rate change was ordered.

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* When the Power Commission started to regulate the interstate electric sales, some companies were obtaining excessive returns. One interstate company, for instance, had a 15 per cent return on a liberally measured property valuation.[50]

An aggressive and acquisitive regulator, the Federal Power Commission was bound to provoke litigation by the natural gas companies. Yet the Supreme Court upheld all the commission orders that were brought to it under the Natural Gas Act. Three cases, which were decided simultaneously in 1945, were interesting because they involved special problems of cost measurement and earnings regulation rather than the general, traditional problem of reasonable earnings.[55] One case, where the decision was split five to four, concerned two companies: one company produced gas in the Texas Panhandle, and sold it to a transmission company which supplied industries and retailing companies in Colorado. Although the commission did not have explicit authority to regulate gas production, it treated the two companies as a single, integrated system and reduced the wholesale prices that the production company charged the transmission company. The majority of the Court approved the indirect regulation of gas production, while the four dissenting justices made the opposite interpretation of the law. Another problem, which concerned cost allocations to the regulated and unregulated sales, affected the transmission company alone. To measure reasonable prices for the wholesale service of the transmission company, the commission needed to know the costs of the unregulated industrial sales. The commission allocated more joint costs to the industrial business than the company was willing to allocate. Disregarding the arbitrariness of any joint-cost allocation, all members of the Court accepted the commission allocations.

TAXES

Increasing rapidly since 1900, the tax payments of utility companies now are a substantial part of the total costs of service. Commissioners usually classify tax payments as reasonable costs of service, and allow companies to recover the payments from the consumers. If the earnings of companies are held close to reasonable returns by frequent and expert regulation, the taxes are shifted to the buyers of service. Since tax payments commonly are costs of service and are chargeable to buyers, there is a conflict between the regulation and taxation of utility companies. Legislators and tax authorities seek revenue for general governmental purposes, and usually disregard the relation between company taxes and consumer prices. On the other hand, utility commissioners wish to use the extra earnings for price reductions or service improvements. If a company has excessive earnings, an increase in tax payments diverts the earnings to tax-revenue channels rather than to consumers. Both the tax authorities and the regulators have interests in the excess earnings. But this governmental conflict is not yet widely or bluntly expressed. The growing magnitude of utility-company taxation, accentuated by wartime increases in corporate taxes, can sharpen the conflict. Perhaps, as the social functions of governments are expanded and as more tax revenue is needed, legislatures will re-examine the limits of public utility taxation.

Growth of the Tax Bill. Being large, frequently prosperous, and handy sources of tax revenue, corporations are taxed more heavily than property owners and proprietorship businesses. And public utility companies, which are quasi-public enterprises and often have large and quite stable earnings, are taxed even more heavily than other corporations. At first the utility companies paid moderate property taxes and some special taxes. During the last part of the nineteenth century and the first part of the twentieth century, a time when most taxes were levied by state and local governments, the property tax was the principal form of utility-company taxation. At the same time, however, the companies paid state and local franchise taxes that were measured by outstanding securities, gross earnings, net earnings, or property units such as poles or miles of track. Franchise obligations were indirect forms of taxation; the free services of electric, gas, and water companies as well as the street-paving and street-maintenance obligations of street railways were large. Local governments wanted generous payments for the use of public property; they wanted compensation for the valuable market privileges that they gave to the utility companies. Local governments, indeed, often preferred to eliminate unreasonable earnings with franchise taxes and franchise obligations instead of price reductions or new service obligations.

At first the utility property valuations for property tax assessments were fixed by local assessors or county auditors. This was an advantage for the companies. Local and county assessors knew something about the market values of homes and farms, but they were poorly equipped to determine the values of public utility properties. Consequently many state legislatures transferred the administration of these property taxes to a state officer or a tax commission, and much of the underassessment of public utility property was eliminated. But the property value (ad valorem) basis of taxation was not easily administered. Looking for a simpler basis of taxation, about half the states substituted gross-revenue taxation for the property-value taxation of utility companies. And, meanwhile, the state legislatures and tax authorities showed inclinations to tax the utility companies more heavily than other corporations. The earnings of utility companies attracted the attention of the authorities who wanted more tax revenue. These companies often were large, had excellent earnings, and lacked strong political support. Legislatures knew that further taxation of them was a safe political way to increase the tax revenue.

Just as taxes in general increased after 1930, so tax payments of utility companies were enlarged. The greatest changes were made in federal taxation. As the functions of the federal government expanded during the depressed thirties, more tax revenue was needed. Federal government expenditures grew severalfold between 1933 and 1940. More funds were needed to finance governmental investigations, unemployment and old-age pensions, relief and rehabilitation programs, increases in farm income, and large public works projects. To support its social security program, Congress assessed separate unemployment and old-age taxes. And the taxes on corporate net incomes were increased. More taxes were levied on all corporations during the Second World War; the normal rates of corporate income taxation were increased, and excess-profits taxes recaptured nearly all the wartime increases in corporate net incomes. After the war ended the federal government could not reduce corporate taxes to prewar levels; it eliminated the excess-profits tax, but the corporate income taxes still were high. New responsibilities, which largely were results of the war, as well as old responsibilities had to be met; the federal government was compelled to pay interest charges on a large debt, to provide services for war veterans, and to support a sizable army and navy. Operating under governmental conditions that necessitated heavy taxation, most utility companies could expect to pay taxes that were more than 20 per cent of their gross revenues.

Taxes as Costs. Taxes are included among the operating expenses that should be covered by allowable revenue. All kinds of taxes—property, income, sales, franchise, social security, and miscellaneous taxes—commonly are classed as reasonable costs of utility service. Even when Congress levied a federal tax of three per cent on domestic and commercial sales of electricity in 1933 and ordered the companies to pay the tax out of their net earnings, some state commissions ignored the Congressional order and allowed the electric companies to shift the tax to consumers.[56] And the Supreme Court decided in the Galveston case of 1922 that income taxes were costs of service rather than reductions of the investors' return.[57] Unlike some commissions that wanted to charge income taxes to the investors instead of the consumers, the Court said that income taxes ". . . must be taken into consideration in determining what rate of return shall be deemed fair." [58]

Commissions do not treat all utility-company taxes as costs that should be charged to consumers. The New York Commission, for instance, counts the state taxes on capital stock and excess dividends among the costs that the stockholders should bear.[59] In the forties some commissions refused to recognize wartime increases in federal income taxes as costs of service.[60] When they totaled up the reasonable costs of utility service, they counted only the prewar income taxes. Considering the exigencies of wartime conditions and the prevention of a price-level inflation, they justified a temporary departure from the decision of the Supreme Court in the Galveston case.* Wishing to stabilize utility rates at "reasonable levels" during the Second World War, the Federal Power Commission, for instance, allowed only "ordinary or normal" taxes as operating expenses.[62] The Power Commission decided that the 1940 rates of income taxation were normal, and that subsequent increases in the rates were abnormal.

A Wartime Conflict. A special conflict of regulatory and taxation policies arose during the Second World War. Congress did not exempt utility companies from the high excess-profits taxes. But the state and federal commissions also could take up the excess returns; they could turn unreasonable earnings into rate reductions or customer refunds. Although the U. S. Treasury accepted the loss of tax revenue, it was still a fact that some commissions diverted the excess returns from the Treasury.[63] When the city of Detroit first asked for a reduction of an electric company's earnings,[64] the Michigan Commission decided that excess profits were costs of electric operations.[65] After the Michigan Supreme Court reversed the decision, the Michigan Commission ordered earnings reductions and customer refunds throughout the state.[66] The Arkansas Department of Public Utilities recaptured nearly all the excessive wartime earnings, and distributed them as customer refunds.[67] And the Missouri Commission also reduced customer rates.[68] Before the war ended other commissions, too, followed the practice, taking away the excess wartime earnings that could be used for federal government expenditures.

Some utility companies were certain to get excessive earnings during the war. Government expenditures on war materials and enlargements of family incomes increased the demand for utility services and gave excessive returns to many utility companies. But the commissions were not required to solve this excessive-earnings problem in the traditional manner. Even if the commissions thought that excess earnings belonged to customers, price reductions were not always the best means of eliminating the excesses. Some of the price reductions were temporary. A wartime reduction of prices might be followed by a postwar increase of rates. That was true if buyer expenditures for utility services declined after the war and were not counterbalanced by cost reductions. If the excess returns went to the buyers instead of the U. S. Treasury, customer refunds were the best means of distributing them. Buyers would not object so strongly to a postwar elimination of refunds as they would to price increases.

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* Other commissions treated all wartime taxes, exclusive of excess-profits taxes, as reasonable costs of utility service.[61]

The buyers did not clearly deserve the wartime excesses in earnings. The excesses grew out of federal expenditures for the war; more electricity, telephone, and other utility services were sold and utility-company earnings increased because factories were operated intensively, and because most families had more income for utility purchases. Expenditures on war contracts created the increases in utility service demand. Creating the excessive earnings, the federal government had a good reason for recapturing them. If state commissions, furthermore, applied the traditional standard of earnings regulation and eliminated the excesses immediately, a little more pressure was put on an already strained U. S. Treasury and Congress to find other sources of tax revenue, or to sell more bonds and to increase the federal debt. As a further fact, most families did not need reductions of their utility service bills. They were not short of income. Payrolls were higher than ever before in the nation's history; the ordinary American family was enjoying so much income that a strong inflation pressure, reflected in many black markets, was created.

The General Conflict. During the war some public utility commissions interfered with excess-profits taxation of the federal government. In ordinary times, however, the conflict of tax and regulatory authorities is reversed; taxation of utility firms interferes with earnings regulation. When the state legislatures and Congress pass tax laws and when the tax authorities administer the laws, the relation of utility-company regulation and utility-company taxation rarely is considered. The effects of taxes on investments, service improvements, and reasonable prices usually are ignored. Companies are taxed, for the most part, as though the regulatory commissions do not exist; tax authorities and regulators scarcely seem aware of their conflicting purposes.

Administration of property taxes illustrates the absence of a relationship between taxation and regulation. Legislatures and tax authorities want tax revenue. The incidence of the property taxes is a secondary problem; and special incidence problems, such as the effect of property taxes on utility prices, commonly are neglected altogether. As they administer property-tax laws, tax authorities determine the taxable values of utility-company properties, give some attention to the equalization of tax burdens, and apportion revenue among government units.[69] When they fix the taxable values of utility systems, tax commissions or other authorities do not distinguish between actual earnings and reasonable earnings. They capitalize the actual earnings.[70] If a company has excessive earnings, some of the excess is collected by the tax authorities. Then the governments become accustomed to the tax payments that are based on unreasonable earnings; they are reluctant to give up any revenue at a later time. Even if regulatory commissions are able to eliminate the excess earnings and wish to make price reductions, utility companies pay the same property taxes; property taxes commonly are a fixed part of the reasonable costs.

Some taxes are applied indiscriminately to all companies and are not designed to get the excess earnings of utility firms. Corporate income taxes and social security taxes are examples of the general taxation of business enterprises. Other taxes are aimed directly at the earnings of utility firms. Franchise taxes and the federal tax on electricity sales are obvious examples. Manipulating property valuations and adjusting millage rates, legislators and tax commissions also can arrange property taxes so that utility companies pay more property taxes per dollar of property investment than are paid by other property owners. Seen through political eyes, these companies are good sources of tax revenue. They often have excellent earnings, and because some consumers have an income inelasticity of demand for service, their earnings usually do not decrease so much during a depression as other corporate earnings. Utility companies do not have many political friends; even the consumers, who have something to lose from taxation, do not try to thwart increases in utility-company taxes. They are "fair game" for the politicians who seek more government revenue.

The incidence of utility taxes is the main point of conflict between regulation and taxation.[71] A distinction can be made between the consumer and the investor incidence of additional taxes; an increase in utility-company taxes either increases prices or reduces the stockholders' return.* Public authorities like to believe that the taxes always are paid by the company investors. Sometimes they are paid by investors; but sometimes, too, the taxes take price reductions away from the consumers. To show the possible effects of utility-company taxation, let us set up several earnings and regulatory cases. In the first case the company is barely earning a reasonable return. Then the property tax or some other tax is increased, and the company asks for a price increase that is expected to cover the increment in taxes. And if the commission grants the price increase and the company obtains the additional revenue, the new taxes are shifted (like the preceding taxes) to the consumers.

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* Public authorities usually do not consider how more utility taxes may affect investments in innovations and new markets. If tax payments are related to investment decisions as they usually seem to be, the relationship evolves over a long period of time. These long-period problems do not interest legislators and tax authorities who have political lives to live and tax revenue to collect.

In the second case the company is earning more than a reasonable return. It receives more than enough revenue to cover the reasonable service costs, including the previously assessed taxes. In this case the prospective regulatory action is an important condition. If the utility commission can be expected to undertake an earnings investigation, the excessive earnings can be turned into price reductions. Additional taxes eliminate the excessive earnings that also can be eliminated with a price reduction. Consequently the consumers really pay the new taxes, because they forego a price reduction. On the other hand, a regulatory investigation of the excessive earnings may not be in sight. If it is not, the additional taxes are not substituted for an anticipated price reduction. And the new taxes are paid by the company's stockholders who must give up dividends or additions to the surplus account. At least the buyers do not give up price reductions that they expect to get.

In the third case a company earns less than a reasonable return. And no price for service can give the company a reasonable amount of earnings. This firm pays high tax bills because at one time it was a prospering enterprise that attracted some special taxes and a high rate of property taxation. Now it is a victim of an inflexible tax policy; the taxes are not scaled down as the company earnings decrease. When these conditions of taxation prevail, part of the present tax bills are paid by the investors. Likewise, any new taxes increase the deficits, and reduce the returns of the security holders. If the earnings deficiency is small, only the common stockholders lose returns. But when the earnings deficit is large, the holders of preferred stocks may not get all their expected returns. An inflexible tax policy can do more than reduce the investor returns; it can impair the credit standing of a utility company and hasten a corporate reorganization.

The third case of tax incidence is a real case that calls for tax abatements. Many steam railway and urban transportation companies, for instance, are burdened with heavy property taxes and special taxes. When these firms prospered before the First World War, local and state governments assessed heavy but still tolerable taxes against them. Street railways paid large property taxes in addition to the franchise taxes and special obligations that local governments imposed on them. Then the demand for street railway service decreased. The earnings of the service decreased, too, but the taxes did not go down. Although the public authorities assessed heavy taxes in early years because the earnings of the companies were high, they did not reduce the taxes because the earnings decreased. This is not a consistent, rational taxation policy. Legislatures seem to need a flexible policy of public utility taxation whereby taxes are adjusted to secular changes in buyer demands and company earnings.

This seems to be a defensible rule for public utility taxation: the utility rate of taxation should be no higher, relative to net earnings, than the tax rates of nonutility companies. Tax equalization between industries is the essence of the rule. Indeed, there is a possible case for lighter taxation of utility companies, relative to earnings, than nonutility companies. Many nonutility companies can obtain more than "normal" returns; they can obtain more earnings than they need to maintain the current output. A few companies often control the markets for nonutility commodities; only a few companies produce most of the nation's steel, rubber tires, autos, sulphur, aluminum, and many other products. Operating in duopoly and oligopoly situations, these companies stabilize prices, take noncompetitive attitudes toward each other, and are not subject to public price controls. These firms often have a better opportunity to get excessive returns than that of even a poorly regulated utility company. Considering these facts, tax authorities can justify higher tax rates on some nonutility earnings than on utility company earnings.

Chapter 12

Property Valuation: The Legal Concept

NOTHING IN the regulation of utility-company earnings ever has received so much attention, historically, as the valuation of property. No other conflict in public utility regulation has been so spirited; none has consumed so much of the time of regulators, companies, and courts; and none has been so inconclusive. In the Smyth v. Ames case of 1898 the Court said ". . . that the basis of all calculations as to the reasonableness of rates to be charged by a corporation . . . must be the fair value of the property being used by it for the convenience of the public."[1] And several kinds of property valuations, including original-cost and reproduction-cost valuations, were listed as factors of fair property values. At first the Smyth decision did not disturb utility regulation; there was not much regulation to disturb. But between 1920 and 1940 the controversy of reproduction cost vs. original cost really came to a head and placed all regulation in jeopardy. The problem of reasonable earnings was turned into a problem of reasonable property valuation. Then around 1933 the Supreme Court began to revise the fair-value concept. And in the Hope Natural Gas case of 1944 it swung to another extreme and eliminated valuation methodology as a primary problem. Justice Douglas, writing the majority opinion of the Hope case and following the reasoning of Chief Justice Hughes in the Los Angeles case,[2] said, "It is not theory but the impact of the rate order which counts."[3]

THE REASONABLE VALUE CONCEPT

The value of a farmer's land, an investor's securities, or a corporation's assets can be measured by market forces—by the prospective earnings from the use of the property. Expected earnings, expressed by market-place estimates of buyers and sellers, are capitalized to determine the property value. This is an objective measure of value; it is free of the personal value that any owner may attach to his property. But it cannot be a reasonable value of public utility property. If the earnings of utility companies are capitalized to determine the reasonable property value, then the commissions can never reduce earnings and prices. The circular reasoning is obvious: actual earnings are used to measure a property value that, in turn, is multiplied by a rate of return to determine the same or a similar amount of earnings. For the same reason the market values of utility-company securities cannot be the measure of the reasonable value; the market prices of securities, like those of any other property, are based on estimates of future earnings. Furthermore, commissions do not base earnings, except in Massachusetts, on the original selling prices of securities. They cannot use the book values or issuing prices of securities for two reasons: (1) the original selling prices of common stocks, like the later market prices of the stocks, are affected by prospective earnings, and (2) the commissions do not have long histories of good financial regulation that assure the elimination of fraudulent and imprudent financing.

An Authoritative Valuation. If market-place considerations do not enter into the property-valuation process, how can the commissions and courts determine the reasonable valuation? One general characteristic follows from the abandonment of the objective, market standard: the reasonable property valuation, which is used to determine earnings, must not be determined by the utility-company earnings. Another general characteristic is evident too: a reasonable property value necessarily is a chosen or judged value, and is controlled by the knowledge and reasoning of the commissions and courts. Considering the preconceived purposes of regulation and the available facts about private utility service, the reasonable value is adjudged the right value for both selling and consuming interests. This is where the valuation controversy comes in. Several choices of a reasonable valuation are conceivable. Seeking a defense for their earnings and prices, companies choose an amount different from that of the commissions wishing to reduce earnings. A state of order rather than chaos calls for an authoritative choice of a reasonable property valuation. Only the Supreme Court, the ". . . first authoritative faculty of political economy in the world's history . . . ,"[4] * has the power to fix a conclusive and absolute standard of reasonable valuation of utility-company property.†

Growing more complex with regulatory developments, a reasonable property valuation consists of different valuations for various kinds of property. It is a task for experts—for specialized accountants, lawyers, and even valuation engineers. A primary distinction is made between tangible and intangible property. And land commonly is segregated from other tangible property, though the land, like other property, usually is valued nowadays at its original cost or investment cost. The aggregate valuation of tangible property is adjusted in two ways: (1) only the "used and useful" property is included, though the commissions and courts usually accept the managerial judgments of what is used and useful, and (2) the accrued depreciation is deducted to determine the net current value of tangible property. One kind of intangible property is called "overhead"; this includes costs of incorporation, legal service, engineering services, and other services incurred during the organization of the business. At times valuations are included for other kinds of intangible property: franchises, leaseholds, water rights, and a going concern. Nowadays the valuation of intangible property is not so significant as it once was; only the cost of franchises, water rights, and leaseholds is allowed, and going value, a special legal category of property valuation, usually is omitted.

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* Quoted by permission of The Macmillan Company, New York, publishers, from John R. Commons, *Legal Foundations of Capitalism,* p. 7.

† The courts vary property valuations according to the purposes of valuations. Different authoritative valuations of property can be discerned for taxation, issuance of securities, financial reorganizations, and earnings control of utility companies. Even when a public agency buys a private utility plant, the property valuation is not always equal to the reasonable valuation for earnings regulation of the same private plant.

The measurement of the whole reasonable value of the property of a company can be expressed in a general formula. Choosing symbols for each element of property valuation, let us suppose that

V is the reasonable value of all property,
t_u is the value of used and useful buildings and equipment,
d_a is the accrued depreciation of buildings and equipment,
l_u is the value of used and useful land,
w is the allowance for working capital,
o is the overhead cost of organizing the business,
i is the value (if any) of franchises, water rights, leaseholds, and patents,
g is the extra allowable value (if any) of a going concern.

The total reasonable value is measured by the general formula:

$$V = (t_u - d_a) + l_u + w + o + i + g.$$

In this chapter attention is concentrated on the valuation of buildings and equipment, the t_u of the equation. The accrued depreciation and intangible property valuations are dealt with in later chapters.

The Main Issue. The chief problem is a choice of a method of tangible property valuation. Looking for the lowest valuation so that consumer price can be low and wanting as well a convenient method to expedite regulatory work, commissions usually prefer an original-cost or prudent-investment standard while the companies, seeking the highest possible valuations and the best protection for their earnings, prefer a reproduction-cost standard.* Defined in the traditional manner, the original cost of property is the aggregate investment in the existing plant. Measured in this manner, the original cost of property is the aggregate investment as a result of either new construction work, arm's-length transactions between unaffiliated companies, or reasonable transactions between affiliated companies. This version of an original-cost valuation sometimes is called the investment cost or actual cost of property. Another concept of original cost became common after the accounting systems were revised during the thirties. It is the "first" cost definition: the original cost of a plant when each property item was first devoted to public utility service. When this "initial-use" concept of original cost is chosen, the property exchanges between utility companies as well as arbitrary write-ups in the property values are ignored. Prudent investment, an infrequent measure of reasonable property value, was strongly proposed by Justice Brandeis, who was anxious to simplify the property valuation process when he was a member of the Supreme Court.[5] The prudent investment is the sum that an ordinary investor, exercising reasonable judgment, was willing to expend on the existing plant. It is determined by adjusting an investment-cost valuation for fraudulent or unintelligent investments.

The reproduction cost of public utility property can be given a number of meanings. A definition of reproduction cost depends mainly on (1) what kind of plant is reproduced, (2) the choice of prices, and (3) the time of the plant reproduction. At one extreme an anticipated reproduction cost is measured: the reproduction cost of a plant is the future investment cost—the future replacement costs of the most efficient available plant. It is the future cost of a plant that has as much productive capacity as that of the existing plant. In a real situation the reproduction cost is the anticipated future cost of plant replacements; much of the present plant is not replaced for many years, perhaps for ten to twenty-five years. But the future technology, future equipment prices, and future construction costs are unknown. Being an uncertain or even an imaginary value, the anticipated reproduction cost cannot be used for practical valuations of public utility property.

Utility companies and valuation engineers prefer current to anticipated reproduction costs. They desire reproduction-cost valuations that can be determined with available facts. Even so, they must choose between different measures of current prices and between different kinds of reproduceable plants. A reproduction-cost valuation can be based, for instance,

* These choices probably would be turned around if costs of reproduction were lower and were expected to remain lower than the original or prudent-investment costs. Both the companies and commissions have opportunistic views of property valuations and earnings control.

on either current equipment prices and construction costs (which valuation engineers call "spot" prices) or three-year, five-year, or even ten-year averages of past prices. A choice must be made, too, between reproduction either of the existing plant or of the existing service capacity.* With one choice the reproduction cost of an identical plant is computed; with the other the current cost of the most economical available plant is determined. The reproduction cost of utility-company property commonly is defined as the replacement cost of the existing plant, measured usually with the average prices of several recent years. Even if the existing plant is outmoded, the reproduction cost of it is computed. Companies, courts, and even some commissions prefer a convenient and factual rather than a logical measure of reproduction cost.

The fair or reasonable value of property is more difficult to define than either original cost or reproduction cost. It is commonly an authoritative standard of property value—the authoritative standard of the Supreme Court, a legislature, or a commission. During the first four decades of the nineteenth century the Supreme Court "considered" both original-cost (investment cost of the present company) and reproduction-cost evidence when a fair value was determined. Fair value was some sort of compromise, average, or balance of original-cost and reproduction-cost valuations. But the Court never did explain how much "consideration" was given to original cost or reproduction cost. Later, after a New Deal revision of its membership occurred, the Supreme Court allowed an original-cost or prudent-investment measure of fair value. Yet, even as it relinquished some authoritative control of earnings regulation, the Court never said what the fair or the reasonable value of utility-company property was. The following historical review of Supreme Court opinions shows the inexact, variable, and sometimes inexplicable meaning of fair property value.

THE EARLY PERIOD

Valuation of public utility property did not become a critical regulatory or judicial problem during the nineteenth century. Some legal thinking about a fair property value appeared, and some of the groundwork for the later valuation controversy was laid. But the regulation of public utility prices was not yet enmeshed in the confusing, constrictive legal rituals of property valuation. Much of the price regulation was done, instead, in ways that did not necessitate measurements of property valuations. During the Granger period the railroad rates often were fixed by state legislatures; statutes prescribed the maximum rate structures for intrastate traffic. And the prices of local utility services, such as street railway and gas service, were specified in franchises and were determined by the bargaining forces of companies and city governments.

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* An existing plant can be reproduced in different ways. It can be reproduced under the original conditions of construction, even though they are out of date; or current and more economical methods of building can be used. Companies and commissions have a choice, too, between piecemeal and simultaneous reconstruction of existing plants. Most utility plants actually are constructed in a piecemeal fashion, though the aggregate investment cost of simultaneous construction is lower. In valuation practice the original conditions of piecemeal construction often are used. In an early case, the Des Moines Gas case, the Supreme Court indicated a preference for original construction conditions; it did not allow the gas company to include the cost of tearing up and replacing pavement that was laid after the gas mains were installed.[6] But the Court did not definitely choose between piecemeal and simultaneous reconstruction of utility plants.

Before Smyth v. Ames. Although the valuation of public utility property was not a critical problem before 1900, the Supreme Court was asked to examine the effects of price regulation in several cases.* When regulation was weak, the confiscation of private property could not be large. But a few companies wanted to thwart any regulation; they wanted to protect every dollar of their earnings. Deciding the Munn case in 1877, the Supreme Court reviewed the Illinois regulations of grain elevators.[8] The main issue was the public utility status of grain elevators in Chicago. A secondary but not an insignificant problem was the effect of the price regulations on the private firm. Recognizing possible misuses of regulatory power but telling the private company to get relief from the voters rather than the courts, the Supreme Court said,

> Rights of property which have been created by the common law cannot be taken away without due process; but the law itself . . . may be changed at the will, or even at the whim, of the legislature, unless prevented by constitutional limitations. . . . To limit the rate of charge for services rendered in a public employment . . . is only changing a regulation which existed before. . . .
>
> We know that this is a power which may be abused; but that is no argument against its existence. For protection against abuses by legislatures the people must resort to the polls, not to the courts.[9]

This view, which was affirmed in several succeeding cases,[10] clearly allowed the legislature to determine the limits of public utility regulation and to measure the reasonableness of utility-company earnings.

The Supreme Court did not long leave the choice of utility-company earnings and prices to legislatures and commissions. Shortly after the Munn case was decided, the Court started to restrict the limits of price control. Seven years later, the Court said in the Stone case that "this power to regulate is not a power to destroy, and limitation is not the equivalent of confiscation."[11] A few years later the Court intimated that it was willing to determine confiscation in connection with rate regulation, and to impose judicial review on the regulators of public utilities.[12]

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* In the Slaughter House cases, which were the first important cases to be decided under the Fourteenth Amendment to the Constitution, the buyers rather than the sellers alleged a confiscation of private property.[7] The Louisiana legislature granted a slaughtering monopoly in New Orleans, and prescribed charges that the slaughtering company could collect from butchers. The butchers claimed deprivation of their property. When the Supreme Court decided the cases in 1873, the majority of the Court could not see any property confiscation which justified an application of the Fourteenth Amendment. Regulation of the slaughtering company was left with the Louisiana legislature.

The right of a company to judicial review of commission control was sanctioned in the Minnesota rate cases of 1890. As the minority of the Court emphasized, the Minnesota rate decision "practically" overruled the Munn concept of regulatory authority.[13] At least the legislature was no longer the final authority in earnings and price control; the Court made the point clear that it intended to determine the confiscation or reasonableness of earnings. And a few years later the Supreme Court held that a rate-fixing statute in Texas confiscated the property of a railroad company.[14] Within fifteen years the Court reversed the part of the Munn decision that told the utility companies to get relief at the polls rather than in the courts. The minority opinions of the Slaughter House and Munn cases became the majority opinions of the Court. No longer was price and earnings regulation an unlimited prerogative of the legislature; no longer was the value of property determined by whatever regulatory effort a state government wanted to exercise. This was the beginning of what Commons calls the reasonable value theory;[15] this was the beginning, which the Court made without explanation,[16] of authoritative judicial review of public utility controls; and above all else this was the beginning of the troubles of the commissions with property valuations as they tried to measure reasonable earnings.

The Smyth Case. A few years after the Minnesota Rate cases were decided, the Supreme Court gave its most noteworthy opinion on the fair value of public utility property. That opinion was given in 1898 in the Smyth v. Ames case.[17] All subsequent decisions about the value of property stem from this decision. In this case the railroad companies claimed that the statutory maximum rates, which were fixed by the Nebraska legislature, were confiscatory and appealed to the Supreme Court for reasonable returns on the outstanding securities. The state, represented by William Jennings Bryan who later became the hero of the rural masses, based its measure of reasonable earnings on the reproduction cost rather than the original cost of property. Apparently the state of Nebraska chose a reproduction-cost base because commodity prices were decreasing, and because accounting records were unregulated and could not be relied on to show the true and legitimate railroad investments.

The Supreme Court decided that the Nebraska maximum rates were confiscatory by any reasoning. But this was not the important fact about the decision. Justice Harlan, who wrote the Court's opinion, went on to state the elements of value by which confiscation could be judged. This dictum, which later became the legal basis of the fair-value doctrine, contained the following, frequently quoted comment on the valuation of public utility property: *

> We hold . . . that the basis of all calculations as to the reasonableness of rates to be charged by a corporation . . . *must be the fair value of the property being used by it* for the convenience of the public. And, in order to ascertain that value, the original cost of construction, the amount expended in permanent improvements, the amount and market value of its bonds and stocks, *the present as compared with the original cost of construction,* the probable earning capacity of the property under particular rates prescribed by statute, and the sum required to meet operating expenses, are *all matters for consideration,* and are to be *given such weight as may be just and right in each case.* We do not say that there may not be other matters to be regarded in estimating the value of the property. What the company is *entitled to ask is a fair return upon the value of that which it employs for the public convenience.* On the other hand, what the public is entitled to demand is that no more be exacted from it . . . than the services rendered . . . are reasonably worth.[18]

This part of the Smyth opinion acquired an importance that was surely beyond anything Justice Harlan anticipated. He was expressing his or the Court's thoughts; he was not laying down rules of regulatory conduct. His comments on a fair property valuation were a supplementary part of the opinion, not a necessary basis for the Smyth decision. The inclusion of some "matters for consideration" seemed to show, moreover, that the Court lacked an understanding of earnings regulation. No commission could consider the "probable earning capacity" of a company unless it wanted to do some circular reasoning.† And the "amount and market value" of outstanding securities was a faulty basis for earnings regulation; the issuance of securities was not regulated, and the market prices of securities were, like the "probable earning capacity," an illogical basis of earnings control. Yet Justice Harlan's comments became the foundation of later fair-value thought. The Court took what it wanted from the "matters for consideration." In later decisions it used the terms "fair value," "present cost," and "original cost" of property. And except for an opinion which Justice Butler wrote in 1938,‡ the Court forgot about the "probable earning capacity" and the "market value" of securities.

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* The italics are mine.

† Perhaps Justice Harlan really did not mean that the "probable earning capacity" should be used to determine the fair value of property. The future earnings could have had a simpler and more reasonable place in the Court's regulatory pattern: after the fair return was measured, the probable earnings under the prescribed rates were calculated to see whether they came up to the fair return.

‡ When the Denver Union Stock Yard case was decided in 1938, Justice Butler, who wrote the Court's opinion, apparently based the fair property value on the present and

The Eminent Domain Analogy. When the Smyth case was decided, what was the meaning of a fair property value? Perhaps the legal meaning of fair value had not yet crystallized; perhaps each member of the Supreme Court had his own vague, loose understanding of it. Prof. Robert Hale concluded, however, that the fair-value concept was derived from the "just-compensation" principle of condemnation (eminent domain) cases.[20] Chief Justice Waite, writing the opinion of the Stone case in 1886, said that rate regulation could not take ". . . private property for public use without just compensation, or without due process of law."[21] And Justice Brewer, who was a Supreme Court justice at the time of the Smyth decision, clearly tied together the fair-value and just-compensation concepts prior to the Smyth decision. He did this when the Smyth case was decided by a federal circuit court.[22] He observed that the "present value of property, and not the cost" was the proper compensation for condemned property. Then he said, "In like manner, . . . the rates . . . cannot be adjudged unreasonable if, under them, there is earned by the railroad company a fair interest on the actual value of the property."[23] This reasoning of Justice Brewer was presented to the Court in the Smyth case, and it probably affected the Court's understanding of the fair-value concept. At least the condemnation analogy seemed to explain why the "probable earning capacity" and the "market value" of securities were "matters for consideration" in the Smyth opinion.

A relation between eminent-domain compensation and a reasonable valuation of public utility property obviously was faulty. Just compensation in condemnation cases was the market value of property. If the reasonable value was equal to the present condemnation value of property, then a commission never could reduce the company earnings or prices. But the Court did not prohibit all earnings and price reductions. Whatever its views were in the Smyth decision, the Supreme Court did not openly and unequivocally adhere to the eminent-domain analogy as it decided later cases. Judged by the important decisions, the Court apparently soon forgot Justice Brewer's equation of the present condemnation value and the fair value.* It had no logical or reasonable place in regulation meant for monopoly pricing and excessive earnings, and was never missed after it dropped out of legal sight.

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prospective earnings that were obtained with "just and reasonable" rates.[19] The reasonable return was used to measure the reasonable property value rather than the other way around.

* But as he wrote the Chesapeake & Potomac Telephone opinion of 1935, Justice Roberts said, "When the property itself is taken by the exertion of the power of eminent domain, just compensation is its value at the time of the taking. So, where by legislation prescribing rates or charges the use of the property is taken, just compensation assured by these constitutional provisions is a reasonable rate of return upon that value."[24]

"CONSIDERATION" OF REPRODUCTION COST

For a long time after the Smyth decision was given, neither reproduction cost nor original cost (investment cost) alone was a proper measure of fair property value. When the fair value of property was determined, the Supreme Court "considered" both reproduction-cost and original-cost valuations. Sometimes it gave substantial weight to a reproduction-cost valuation. In other cases it seemed to give most attention to the original-cost valuations—to the investments that the existing companies made in their properties.* But it did not say just how much weight should be given to either the reproduction cost or the original cost. Determining the fair value of properties as cases were presented to it, the Court refused to define fair value; it refused to fix a definite, certain procedure for earnings regulation. The Supreme Court did not believe, in fact, that the fair value of public utility property should be measured with a formula. In the Minnesota Rate cases of 1913 it said that the determination of property value ". . . is not a matter of formulas, but there must be a reasonable judgment, having its basis in a proper consideration of all relevant facts."[25] Fair value was determined by giving "just and right" consideration to "all relevant facts" in each case.

Early Attention to Reproduction Cost. Before the First World War the commissions did not always oppose consideration of reproduction-cost valuations. Sometimes the reproduction cost of property was a more trustworthy figure than its original cost, because commissions had either no control or inadequate control of plant accounts.[26] Some companies had insufficient or unclear records of plant investments; others inflated the book values of their plants; and uniform accounting systems were not yet adopted. Nor did the commissions have enough funds for intensive audits of the investment costs. But when construction costs increased during the First World War, the utility companies began to demand consideration of the reproduction costs of their plants. State commissions and local governments recognized increases in wages, raw material prices, and other operating expenses, and were willing to translate them into higher prices. Utility firms often wanted more; they wanted returns on high reproduction costs of their properties. Seeing large increases in plant construction costs, they anticipated capital impairments unless the service prices were increased.

The Supreme Court first met the condition of changing price levels in the Consolidated Gas case.[27] A statutory gas rate of 80 cents for each thousand cubic feet was fixed for New York City. When a lower federal court decided the case in 1920, the wartime price level had not yet collapsed.[28] Judge Learned Hand, who wrote the lower court opinion, approved a reproduction-cost base, though he did not want to use it when construction costs and equipment prices were unstable. He objected to consideration of both an original-cost and a reproduction-cost valuation. The Supreme Court, which approved the lower court decision, was not compelled to deal with the general valuation problem. The 80-cent rate did not yield a fair return on any property valuation. Nor was the Supreme Court compelled to choose between a reproduction cost and an original cost in the Galveston case.[29] Both the company and city used reproduction-cost valuations to measure the reasonable earnings. But the company and city had different views on where the postwar prices and construction costs would level off. They made different guesses about the "normal" reproduction cost; the federal district court considered "all relevant facts" and made another estimate of normal reproduction cost; and the Supreme Court approved the lower court opinion in 1922. The Supreme Court avoided "consideration" of original cost and reproduction cost before 1923.

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* At this time neither the Supreme Court nor the state commissions defined the original cost of property as it now is defined for accounting purposes—as the cost of property when it was first used for public utility service.

During 1923 the Supreme Court decided three rate cases, and gave a different weight to reproduction cost in each one. In the Southwestern Bell case the Missouri Commission did not make a current reproduction-cost valuation of the company property; the commission's final valuation was less than the book value of the property and much less than the company's measure of reproduction cost. Deciding that the commission rates were confiscatory, the Supreme Court said,

> It is impossible to ascertain what will amount to a fair return upcn properties devoted to public service without giving consideration to the cost of labor, supplies, etc. at the time the investigation is made. An honest and intelligent forecast of probable future values, made upon a view of all relevant circumstances, is essential. . . . Estimates for tomorrow cannot ignore prices of today.[30]

In the Southwestern Bell case the Court clearly insisted on consideration of the reproduction-cost valuation. And the Court showed a preference, as in the Galveston opinion, for a "normal" measure of reproduction cost. It said that "an honest and intelligent forecast of probable future values, made upon a view of all relevant circumstances, is essential." But it did not say how "probable future values" could be intelligently forecast.* Utility companies and private valuation engineers interpreted the

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* Nor did the Court explain the measurement of "probable future values" in later decisions.[31] It never required companies and commissions to make true forecasts of reproduction costs. Instead, in subsequent cases it often accepted reproduction-cost valuations

Southwestern Bell opinion to mean that reproduction cost was the most important factor in the fair valuation of public utility property. They naturally liked this interpretation. They wanted to believe that the conflict between the majority opinion and the concurring but critical opinion, wherein Justice Brandeis strongly argued for a prudent investment standard, showed a strong judicial preference for reproduction-cost valuations.

In 1923 the Supreme Court also decided the Bluefield case. The commission rates for the water company were held to be confiscatory. Again the Court rejected a commission valuation because too little consideration was given to reproduction cost. It said that the valuation was ". . . materially less than would have been reached by a fair and just consideration of all the facts."[32] This time all the members of the Court, including the supporters of a prudent investment standard, agreed unanimously on the decision; all of them believed that the rates were confiscatory. If the Georgia Railway and Power case had not been decided on the same day, utility companies doubtless would have proclaimed the controlling importance of reproduction-cost valuations. But in the Georgia decision, which was written by Justice Brandeis, the Court upheld the state commission's refusal to use reproduction cost as the measure of fair property value.[33] Consideration of reproduction cost was sufficient. Important cases were decided in 1923, but the Supreme Court still did not clarify the meaning of a fair property value.

The Climax. When the Supreme Court decided the McCardle case in 1926, it seemed to focus attention on the reproduction-cost valuation and to subordinate the original-cost valuation. No preceding court opinion ever emphasized the significance of a reproduction-cost valuation so strongly; no succeeding opinion ever came so close to a reproduction-cost standard of fair property valuation. This decision was the high legal mark for reproduction-cost valuations. Perhaps the apparent stabilization of the postwar price level influenced the Court's reasoning. Or perhaps Justice Butler, a conservative member of the Court who wrote the McCardle opinion, overstated the reasoning of the Court. At any rate Justice Butler said,

> . . . it is true that, if the tendency or trend of prices is not definitely upward or downward and it does not appear probable that there will be a substantial change of prices, then the present value of lands plus the present cost of constructing the plant, less depreciation, if any, is a fair measure of the value of the physical elements of the property.[34]

When the Court decided the McCardle case, it wished to use both the "spot" prices and future prices as the reproduction cost was computed.

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that were computed by averaging (e.g., a five-year average) past prices; it accepted an average of recent reproduction costs and did not insist on anticipated reproduction costs.

Justice Butler said that "... consideration must be given to prices and wages prevailing at the time of the investigation; and, in the light of all the circumstances, there must be an honest and intelligent forecast as to probable price and wage levels during a reasonable period in the immediate future." [35] Another "consideration" was added to the valuation problem: both the present and probable prices were parts of the official valuation procedure. The Court also preferred a reproduction-cost valuation for the existing plant rather than an alternative and more efficient plant. "Save under exceptional circumstances," Justice Butler said, "the Court is not required to enter upon a comparison of the merits of different systems." [36]

Utility companies hailed the McCardle decision as a great victory for their valuation standard. For at least a decade after the McCardle opinion was delivered, no earnings investigation was complete unless a reproduction-cost valuation of property was made; commissions and companies alike made reproduction-cost studies, delaying price changes until these costly and protracted valuations were completed; and the valuation engineers prospered. But the Supreme Court did not make any more notable decisions in favor of reproduction cost. In the O'Fallon decision of 1929, which concerned the recapture by the Interstate Commerce Commission of a railroad company's earnings, the Court repeated the general formula—the consideration of both reproduction-cost and original-cost evidence.[37] And the Chesapeake & Potomac Telephone decision of 1935 turned chiefly on a special question of valuation procedure, an index-number measurement of the fair property value.[38]

The Brandeis' Dissent. The fair-value standard of Justice Butler and other property-minded justices, the rule which gave "consideration" to both original-cost and reproduction-cost valuations, was strongly opposed by some members of the Supreme Court. Justices Brandeis and Stone strongly objected to the standard, and Justices Holmes and Cardozo were not always willing to use it. When the Southwestern Bell case was decided in 1923, Justice Brandeis wrote an extensive criticism of the Court's valuation reasoning. Dissenting from the reasoning but not the judgment of the case,[39] he asserted that the Smyth v. Ames rule was "legally and economically unsound." He scorned a valuation doctrine which "... sets the laborious and baffling task of finding the present value of the utility." The instability of rate control, the "standing menace of renewed controversy," and the cost of constantly recurring appraisals—these were the effects of giving consideration to reproduction-cost valuations. Justice Brandeis was dissatisfied with a standard that mixed dissimilar property valuations to find the fair value, because "obviously 'value' cannot be a composite of all these elements." He suspected that "the rule by which the utilities are seeking to measure the return is, in essence, reproduction cost . . . or prudent investment, whichever is the higher."

Justice Brandeis was willing to give the companies sufficient earnings so that private investors were attracted to the utility industries, but he was not interested in property valuations that fluctuated and could be manipulated by engineers. He wanted a prudent investment basis of earnings control. Basing the fair-return measurements on prudent investments, the Supreme Court could avoid the "delusive" calculations, "shifting theories," and varying estimates that the engineers used as they measured the reproduction costs and present values of utility properties. And prudent investment, Justice Brandeis thought, was what the Court was looking for in the Smyth case. Since accounting data were unreliable and financial transactions were not controlled by the commissions, the Court was forced to consider reproduction costs (present values) in 1898. Considering the present-value standard an expedient choice, Justice Brandeis wanted to turn to a "definite, stable, and readily ascertainable" valuation of property. Arguing that his "factual" basis of valuation assured more orderly regulation, he said,

> The adoption of the amount prudently invested as the rate base and the amount of the capital charge as the measure of the rate of return would give definiteness to these two factors involved in rate controversies which are now shifting and treacherous, and which render the proceedings peculiarly burdensome and largely futile. Such measures offer a basis for decision which is certain and stable. The rate base would be ascertained as a fact, not determined as matter of opinion. It would not fluctuate with the market price of labor, or materials, or money. It would not change with hard times or shifting populations. It would not be distorted by the fickle and varying judgments of appraisers, commissions, or courts.[40]

Other Dissenting Opinions. Writing a dissenting opinion for the Chesapeake & Potomac Telephone case and supported by Justices Brandeis and Cardozo, Justice Stone attacked the elusiveness of the fair-value concept. He impugned the reliability of engineering appraisals and estimates, judging them to be no more trustworthy than the Maryland Commission's measure of fair property value with index numbers. As he viewed the measures of fair value, he saw nothing better than estimates, speculations, even distortions. He said,

> In assuming the task of determining judicially the present fair replacement value of the vast properties of public utilities, courts have been projected into the most speculative undertaking imposed upon them in the entire history of English jurisprudence. . . . When we arrive at a theoretical value based upon such uncertain and fugitive data we gain at best only an illusory certainty.[41]

Justice Stone observed what other students of utility regulation saw in the fair-value doctrine: an illusory value, vague and based on speculations. Justice Stone thought he saw what Gerard Henderson, for instance, observed in 1920: a "gigantic illusion" of measuring a fair value that could not be calculated.[42]

Justice Black dissented sharply from the McCart decision. He objected to the slow pace of judicial review. The Supreme Court remanded the McCart case for a new hearing, because prices and business conditions changed after the commission gathered facts for a decision; the commission decided the case in December, 1932, but the Supreme Court did not decide it until January, 1938. At this rate, Justice Black predicted, the case would come up for a new rejection in about five or six years.[43] He ascribed the sluggishness of earnings and price regulation to the fair-value rule—particularly to the necessary consideration of reproduction cost. Like other "liberal" justices, he preferred to base the reasonable return on the company's "actual investment." Indeed, he thought that

> Wherever the question of utility valuation arises today, it is exceedingly difficult to discern the truth through the maze of formulas and the jungle of metaphysical concepts sometimes conceived, and often fostered, by the ingenuity of those who seek inflated valuations to support excessive rates. . . . Completely lost in the confusion of language—too frequently invented for the purpose of confusing—commissions and courts passing upon rates for public utilities are driven to listen to conjectures, speculations, estimates and guesses, all under the name of "reproduction costs."[44]

THE SHIFT TOWARD ORIGINAL COST

When the depression of the thirties deepened and public pressure for utility price reductions increased, the meaning and significance of the fair valuation of public utility property began to change. At first the Supreme Court put less emphasis on the consideration of reproduction-cost valuations. Later it left the choice of fair property values to the commissions, and gave more attention to general regulatory problems and consumers' interests. The Los Angeles Gas & Electric decision in 1933 was the turning point in the valuation controversy. In this case the California Commission openly admitted the use of an original-cost base rather than some combination of original-cost and reproduction-cost valuations. The California Commission always used a historical cost (original cost) base for reasonable earnings measurements. Examining the particular facts of the case, the Supreme Court did not require consideration of reproduction-cost evidence. Since the price level dropped after the company investments were made, the original costs did not underestimate the present values of the assets; the original costs were better evidence of the present values than the company's evidence. Giving the California Commission freedom to choose a valuation method but not to make a final judgment of reasonable earnings, Chief Justice Hughes said,

> The legislative discretion implied in the rate making power necessarily extends to the entire legislative process, embracing the method used in reaching the legislative determination as well as that determination itself. . . . [The] question is whether the rates as fixed are confiscatory. And upon that question the complainant has the burden of proof and the Court may not interfere with the exercise of the State's authority unless confiscation is clearly established.[45]

The Lindheimer and Dayton Cases. Deciding the Lindheimer case in 1934, the Supreme Court showed some dissatisfaction with the fair-value rule.[46] The Illinois Commission ordered a telephone company to reduce rates that had been used for more than a decade. When the company appealed the order, a federal district court decided that the new rates were confiscatory. And the district court, using the fair-value rule, even found that the *old* rates were "grossly confiscatory." Yet the company never objected to the old rates. Apparently the company was not aware that it suffered "confiscation" of its property for a decade. Judged by the telephone company's conduct, the Smyth v. Ames standard of reasonable earnings was at odds with a reasonable business standard of earnings. As the Supreme Court could see, the company enjoyed a financial success under the old rates. Chief Justice Hughes said, "The financial history of the Illinois Company repels the suggestion that during all these years it was suffering from confiscatory rates." This firm expanded operations by reinvesting earnings, maintained its plant in good condition, kept down increases in indebtedness, and paid 8 per cent dividends regularly on its common stocks. Finding the fair-value measure of confiscation at "war with realities," the Chief Justice said that

> The glaring incongruity between the effect of the findings . . . as to the amounts of return that must be available in order to avoid confiscation, and the actual results of the Company's business makes it impossible to accept those findings as a basis of decision.[47]

The Dayton Power & Light case, which also was decided in 1934, presented facts that were similar to the facts of the Lindheimer case.[48] Even if the new rates were approved, the Dayton Company still could not obtain a reasonable return on its own measurement of a fair property valuation. The proposed rates gave the company only slightly more than a 1 per cent return on the company's measure of a fair property value. Yet the firm was not worried about the low rate of return or the confiscation of property. These facts put a "strain on credulity to argue" that the company could be satisfied with such a low rate of return. They suggested, instead, that the company had an inflated rate base. Consequently Justice Cardozo said that

> The argument proves too much; the valuations are discredited by the teachings of experience. Men do not transact business without protest at confiscatory rates, at all events in the absence of extraordinary circumstances making submission to the loss expedient. . . . Nothing in the record lays the basis for a belief that the natural gas business in Ohio is unable to pay its way. . . . We shall hardly go astray if we prefer the test of conduct.[49]

Yet, even if the Court did not go astray in this case, it still did not repudiate the fair-value doctrine that almost led it astray.*

Natural Gas Pipeline Case. A change in the reasonable-return standard came in the forties. In the words of the minority, whose concurring opinion attracted so much public attention, the Natural Gas Pipeline decision of 1942 ". . . starts a new chapter in the regulation of utility rates. . . ." [53] Accepting the company's valuation of property, the Federal Power Commission ordered the firm to make temporary rate reductions. Since the Power Commission used the company's valuation of property to compute the temporary rates, the Supreme Court was not confronted with a property valuation controversy. The majority of the Court also believed that the statutory requirement of "just and reasonable" earnings was an adequate standard of earnings regulation. A property valuation might be a useful means of measuring reasonable earnings, but it was not an indispensable means. Speaking for the majority, Chief Justice Stone said,

> The Constitution does not bind rate-making bodies to the service of any single formula or combination of formulas. Agencies . . . are free, within the ambit of their statutory authority, to make the pragmatic adjustments which may be called for by particular circumstances. Once a fair hearing has been given, proper findings made and other statutory requirements satisfied, the courts cannot intervene in the absence of a clear showing that the limits of due process have been overstepped.[54]

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* Two valuation cases were decided in 1938. Even though the Pacific Gas & Electric case turned on questions of regulatory procedure, one fact about the property valuation was significant: the Supreme Court approved the California Commission's scrutiny and rejection of reproduction-cost evidence, and did not rebuke the commission for the use of an original-cost standard.[50] In the Denver Union Stock Yard case the Secretary of Agriculture, who controlled the prices of stockyard services, used a reproduction-cost valuation, but the Court did not.[51] Seeking a valuation of a going concern, Justice Butler twisted the Smyth rule and found a fair value by capitalizing the earnings. Justice Butler said, "Value depends upon use and is measured, or at least significantly indicated, by the profitableness of present and prospective service rendered at rates that are just and reasonable. . . ." [52] Measuring the reasonable rates first and using the reasonable earnings to measure the fair property value, Justice Butler clearly did not follow the valuation standard of the Smyth case.

Justices Black, Douglas, and Murphy, who presented the minority and concurring opinion of the case, wished to go further. They wanted to break cleanly with the traditional Smyth rule of reasonableness. According to their reading of the majority opinion, they believed that the commission was free to choose the prudent investment of property as a basis for "just and reasonable" rates. Like Justice Brandeis, they thought that investors were adequately protected with a prudent investment standard. These justices thought that an "expert" commission instead of the courts should "prescribe what formula should be used." The authority of courts, they believed, ". . . should be reduced to the barest minimum which is consistent with the statutory mandate for judicial review. . . ." Preferring legislative rather than judicial control, the minority obviously wanted to return to the rule of the Munn case, and to eliminate judicial review of price changes.

The majority opinion did not clarify the status of property valuations in earnings regulation. It contained a reference to the zone of reasonableness, and the fair or reasonable return was mentioned frequently. But the term "fair value" never was used. This omission could mean that the Court was trying to make property valuation something less than the crux of earnings regulation, that it was trying to modify rather than eliminate the fair-value tradition. Perhaps the majority had a broad standard of reasonable earnings in mind, a standard of "successful" business operations such as the Court used in the Lindheimer and Dayton cases. Yet the Court did not forthrightly repudiate the fair-value concept. As Robert Hale observed after the Natural Gas Pipeline decision was given, the "ghost" of Smyth v. Ames still walked and public-utility regulation continued "to be enveloped in its fog." [55]

The Hope Natural Gas Case. If the Supreme Court started a "new chapter" about public utility regulation with the Natural Gas Pipeline decision, it wrote more of the chapter when the Hope Natural Gas case was decided in 1944.[56] The Smyth rule, providing for a fair return on a present property value, was abandoned.[57] The Federal Power Commission ordered the Hope Natural Gas Company, a producer and transporter of natural gas that was first subjected to direct regulation under the Natural Gas Act of 1938, to make a large reduction in wholesale gas rates.[58] An aggressive proponent of a first-cost standard of reasonable property valuation, the Power Commission based the reasonable return on a property valuation that was only half as large as the company's own valuation. Unlike the Natural Gas Pipeline case, the Hope case unquestionably presented a valuation controversy to the Court. The members of the Court offered several solutions of the conflict ranging from the traditional fair value to the rule of the Munn case. In addition to the majority opinion, which approved the Power Commission's order, the decision contained a separate concurring opinion by Justices Black and Murphy, and three separate dissenting opinions by Justices Reed, Frankfurter, and Jackson. The Court changed the legal nature of earnings regulation, but five separate opinions showed that the legal status of reasonable-earnings regulation still was not settled.

The majority of the Court, whose opinion was written by Justice Douglas, was willing to rely heavily on the expert judgments of regulators. Repeating parts of the Natural Gas Pipeline decision, the majority granted the commissions opportunities to make "pragmatic adjustments" and did not bind them "to the use of any single formula or combination of formulae in determining rates." The majority went further and abandoned reliance on any specific measure of "just and reasonable" earnings. Earnings were important; the method of their determination was unimportant. Justice Douglas said,

> Under the statutory standard of "just and reasonable" it is the result reached not the method employed which is controlling. It is not theory but the impact of the rate order which counts. If the total effect of the rate order cannot be said to be unjust and unreasonable, judicial inquiry under the Act is at an end. The fact that the method employed to reach that result may contain infirmities is not then important.[59]

How did the majority propose to determine reasonable rates? Justice Douglas did not have much to say on this point. He said, "From the investor or company point of view it is important that there be enough revenue not only for operating expenses but also for the capital costs of the business," including interest charges and stock dividends.[60] And he repeated earlier opinions of the Court, saying the company should be able to maintain its credit standing and to attract capital. To determine the reasonableness of the Hope Company's earnings, the majority looked primarily at the financial history of the company—at the market position, credit standing, financial obligations, and past dividends of the firm.

The dissenters believed, on the contrary, that the method of earnings regulation did make a difference. Justice Reed, who thought the rates should not be "left to the whim of the Commission," wanted a precise rather than an abstract test of reasonable earnings; he preferred the fair-value rule until Congress designated some other standard.* Justice Frankfurter did not wish to leave earnings regulation altogether to the "skill of experts"; he thought an "encouragement of conscious obscurity or confusion" did not represent an improvement on the "hodgepodge" of the Smyth v. Ames rule; and he believed that the Court "should set forth with explicitness the criteria" of just and reasonable rates. He was opposed more to the narrow vision of the Power Commission, which relied on accounting data and did not look forward to future investment conditions, than to the lowness of the rates. And Justice Jackson, who wrote a long dissenting opinion, apparently approved a prudent-investment valuation for most kinds of property. Like Justice Frankfurter, he wanted some "conscious design" for decisions about reasonable and unreasonable prices. Later he spoke about the economic directions of price fixing, about the difference between mechanically determined prices and prices as incentives for natural gas production.

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* Justice Reed thought that the "major error" in the Power Commission's order was the omission of gas exploration investments from the rate base. Prior to 1923 the company charged well-drilling costs to operating expenses. The company included these costs (about $12,600,000) in the rate base. But the Power Commission excluded them, saying they were paid by the consumers. Justice Reed saw an elemental error in the Power Commission's reasoning: the commission could not control accounting transactions that occurred fifteen or more years before it had authority to regulate the company.

The dissenters have an obvious basis for their objections to the majority opinion. Nowhere in Justice Douglas' opinion is a new standard of reasonable earnings clearly set forth, unless the majority opinion can be interpreted as a reversion to the Munn decision—unless reasonable prices and earnings are exclusively legislative and administrative questions rather than judicial questions. The financial history of the Hope Company is examined for evidence of reasonable returns. True; but a statistical summary, larded with such phrases as "seasoned enterprise" and "financial integrity," gives the commissions no objective measurement of a reasonable return. Commissions are not confined to an official, rational pattern of earnings regulation. Each commission can choose its own measure of reasonable earnings. A commission can see what it wants to see, telling the company and courts that the choice is sensible and fair. Yet the Court now seems to have a hidden standard of reasonable property valuation: prudent investment or original cost. Members of the Court know that most commissions prefer a first-original-cost or investment-cost base for earnings determination, but they do not commit themselves openly and irrevocably to such a valuation.

An old and thorny problem, the measurement of reasonable earnings, is not a subject for judicial review. The Supreme Court solves the matter by renouncing an interest in it; it hands the fair-return measurements and perhaps other methodological work exclusively to the legislatures and commissions. From a period of judicial domination, marked by close adherence to the Smyth rule, regulation moves into an era of administrative authority. Responsibility for reasonable returns is shifted to the commissions; the consequences of earnings and price control are fixed more heavily on commissioners, the unskilled and irresponsible as well as the expert and wise, than they ever were. Under the Hope decision a commission is free to choose the used and useful plant, the kind of property valuation, the deduction for accrued depreciation, and a rate of return for a company. According to Justice Douglas' opinion, the Court, to be sure, still can review the reasonableness of commission calculations. If many commission decisions are reviewed in a thorough and rational manner, the Court cannot escape measurements of fair returns; it cannot fail to recognize that the choices of methods affect the results. If the decisions are not reviewed for their reasonableness, the Court really turns back to the Munn decision without admitting the reversion.

Although the Hope decision abandons judicial interest in property valuations, it does not settle conflicts about reasonable valuations. Several controversies can develop in the next decade. One of these is the meaning of reasonable investments. Preferring valuations that can be copied from accounting records, some commissions use the first original costs; they go behind all property exchanges between affiliated and unaffiliated companies that may translate excess earnings into higher property values. The Federal Power Commission is a leading proponent of first-cost valuations, though it does not absolutely exclude all other measures of the rate base.* Another valuation, which is supported naturally by the companies as long as they cannot get approval of reproduction costs, is the investment cost—the actual investment that the present company has in its property. With this measure the affiliated companies may not be allowed any profits on property exchanges, but other exchanges are figured at their investment costs; prudent investment decisions, which usually were approved or allowed by commissions, are respected. Perhaps the Supreme Court, recognizes a connection between reasonable methods and reasonable results, may come back ultimately to the valuation question and decide what is and what is not a reasonable investment.

OTHER ELEMENTS OF PROPERTY VALUATION

Before the Hope decision the Supreme Court dealt with property valuation questions other than fair valuations of tangible property. One of these was "used and useful" property, the kind on which a utility company is entitled to a return. Another was the deduction of accrued depreciation to determine the net reasonable value of property. Valuation of used and useful land usually was set apart from the valuation of other kinds of property. Separate valuations always were made, too, for working capital. And special legal attention was given to the overhead investment costs that were connected with the organization of utility companies.

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* The Power Commission has a concept of reasonable property value that is not quite clear. It excludes reproduction cost and intangible values, accepts a prudent investment standard, and says that prudent investment is not necessarily equal to the first original cost.[61] Yet when the intangible values are excluded from present investment costs, the commission does not clearly have anything left above the first original costs.

Used and Useful Property. A utility company is entitled to a return on only its "used and useful" property. Compilation of an inventory of used and useful property is the first step of reasonable valuation. The used and useful inventory is compiled, indeed, regardless of the property valuation standard; it is a necessary preliminary to the computation of either an original-cost or reproduction-cost valuation of property. Since property inventories are assembled by engineers and accountants rather than economists, technical evidence usually determines the used and useful character of properties. Nonutility property and abandoned equipment are not included, of course, in the inventory. Yet, even if equipment is used only part of the time or even if the full capacity of equipment never is used, it commonly is classified as used and useful.

Stand-by plant, reserve-plant capacity, idle plant during off-peak periods of service, plant capacity for anticipated demand increases, land purchases for expansion—all of these usually are classed as used and useful property. Except for a few decisions,[62] commissions do not pare down the used and useful inventory when the demand for service decreases. Nor do they carefully scrutinize public utility plants for evidence of excessive plant capacity or completely obsolete equipment. Commissions generally accept managerial judgments of what is used and useful property. If a company invests in new plant, the wisdom of the investment is taken for granted; if it says that all of its plant is used and useful, the commission generally accepts the company's statement.

Because the commissions and companies rarely disagreed about the property inventories, Supreme Court decisions seldom dealt with useful property. In one case, the Columbus Gas & Fuel case of 1934, the Ohio Commission eliminated part of the undeveloped gas acreage from the property inventory. If the rate of gas consumption was the basis of measurement, the company had an excessive reserve gas acreage, it could serve more than a reasonable future demand for gas. Upholding the commission, the Supreme Court, whose opinion was written by Justice Cardozo, saw ". . . no need in the computation of the rate base to include the market or the book value of fields not presently in use, unless the time for using them is so near that they may be said, at least by analogy, to have the quality of working capital."[63] "At times," Justice Cardozo said, "the immediate purpose of buying up extensive tracts is to forestall or stifle competition that might bring the prices down."[64] But a natural gas company should not be denied a substantial reserve acreage of proved and unproved gas land, unless consumers want to restrict the expansion of the company or to take the chances of gas shortages. A company cannot predict gas discoveries accurately. Complete control of a proved gas field, furthermore, often is economical. Holding all or nearly all the leases of a gas-producing area, a firm controls the production of gas and avoids premature development of the gas pool. No rival gas producer can upset the production plans of the utility company. Stifling competition, a gas system can economize the production costs.

Excessive plant capacity was an incidental fact in the Natural Gas Pipeline case. When the company built a line from the Texas Panhandle to the Chicago area, the plant capacity was much larger than the immediate demand for service. The main issue was not the usefulness of the unused plant; it was a company claim (rejected by both the commission and the Supreme Court) for a going value allowance that was based on the maintenance costs of the unused plant capacity. Yet the Court did comment on the usefulness of the whole pipe line. "It is only on the assumption," the Court observed, "that excess capacity is a part of the utility's equipment used and useful in the regulated business, that it can be included as a part of the rate base on which a return may be earned."[65] Utility companies should be encouraged to plan for increases in demand, particularly during depressions and in expanding industries. That is the economical way to invest in durable, expensive plants. When some plant capacity is unused temporarily, it is properly treated as useful plant on which a firm is entitled to a return.

Accrued Depreciation. Determining the net property value on which a company receives a return, a commission deducts the plant depreciation from the tangible property value. This deduction is called "accrued depreciation." If an original-cost standard of property valuation is used, the "original cost less depreciation" is computed; if a reproduction-cost valuation is desired, the "reproduction cost new less depreciation" is the final valuation. Companies and commissions disagree about the proper measure of accrued depreciation. Commissions commonly wish to deduct the depreciation reserves. The depreciation reserve of a prospering firm measures the amount of recovered or earned depreciation; it measures the aggregate depreciation cost that has been "charged" to buyers. The utility companies, on the other hand, usually wish to recognize only the declines in plant efficiency, seeking a technical rather than a financial measure of accrued depreciation. They put it this way: if the plant is fully maintained and can produce as much service as a new plant, there is no accrued depreciation. The Supreme Court does not yet say clearly in any case that the depreciation reserve is a proper measure of accrued depreciation, though it did not criticize a reserve deduction in the Hope Case.*

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* A further discussion of accrued depreciation appears in Chap. 15.

Valuation of Land. If railroad and natural gas companies are excluded, land is not an important part of utility plants. Since land is a minor part of most utility property, the land valuation seldom is a controversial issue in earnings regulation. Yet, even before the Supreme Court confronted the large and often inflated reproduction-cost valuations of companies during the twenties, it had a definite rule for the fair valuation of public utility land. After the Smyth case was decided, railroad companies measured their "present" land values as multiples of adjacent land values. They computed the unit prices of adjacent farm and urban lands; then they doubled or tripled these unit prices to compute their own land values. Defending the "multipliers," they said that, even if the right of eminent domain was exercised, the cost of land commonly exceeded the market prices of land; they made hypothetical allowances for excessive condemnation prices, severance damages, and unnecessary improvements on the acquired land. In the Minnesota Rate decision of 1913 the Supreme Court rejected the use of multipliers. According to the reasoning of the Court, ". . . it is impossible to assume, in making a judicial finding of what it would cost to acquire the property, that the company would be compelled to pay more than its fair market value."[66] The Court allowed no more than the market price of adjacent land as the fair-value measure of public utility land.

When the Supreme Court decided the Dayton Power & Light case in 1934, it approved an original-cost valuation of natural gas land. The market value of gas-producing land increases after a gas pool is discovered. Land with a gas or oil pool always sells for a higher price than similar land without these resources. Yet, while a gas discovery increases the market value of a company's land, it does not follow that utility consumers should give the firm a return on the higher property valuation.[67] The market price of gas land is not altogether independent of utility service prices: utility consumers buy most of the gas of Appalachian fields, and they buy much of the natural gas output in other areas. If circular reasoning is avoided, a property value cannot be based on the prices that are subject to public control. Another consideration goes against a return on the market price of natural gas land. Gas companies obtain revenue from consumers that is used to cover the gas exploration costs. Since buyers pay some or all the costs of gas discoveries, they should not pay a return, too, on increases in land prices.* In the Dayton decision Justice Cardozo said,

> . . . there has been no infringement of constitutional immunities unless a higher value [higher than cost] has been made out by evidence too strong to

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* A similar problem, the valuation of natural gas leaseholds, is discussed in Chap. 14.

be rejected. . . . Court and commission were free in their discretion to reject as unsatisfactory the conflicting opinions of a group of friendly experts. They were free in their discretion to refuse to draw an inference of value from the prices stated to have been paid upon a few purchases and sales.[68]

Overhead Costs. When a utility enterprise is organized, the investors incur expenditures for incorporation, engineering investigations, legal services, and so on. And when plants are built, companies pay for engineering supervision, interest or taxes during the construction period, and other costs that cannot be allocated readily to specific units of property. These are overhead costs. The Supreme Court approves valuation allowances for certain kinds of overhead investment costs.[69] But it does not approve conjectural allowances, the kind of costs that utility companies imagine for promotion, financial planning, and general organization of their businesses. Commissions prefer actual measures of overhead investment costs, and often refuse valuation allowances for overhead costs whenever the companies cannot present evidence of the expenditures.

Commissions prefer or even insist on separate calculations of each overhead cost rather than a lump sum for all such costs. A dollar sum is preferable. One kind of overhead cost is represented by the original promoter's expenses, but these are seldom allowed nowadays because the Supreme Court thinks they are "too conjectural." [70] A sum, which is called organization expense, is customarily allowed for legal costs and other costs of incorporation, issuance of franchises, and establishment of financial connections. Administrative costs such as salaries and office expenses, which are incurred prior to the commencement of operations, are recognized in the organization expenses. Some organization expenses, including the costs of lobbying, are not allowed; other expenses, loosely grouped under "general expenses," often are excluded too. When the contractor is an affiliated company, a utility firm gets no allowance for contractor profits from an alert commission. But utility companies usually receive a substantial valuation allowance for "engineering and supervision"—particularly for planning and administrating the construction of the plant. Interest during construction, measured usually by the company's own cost of capital, is an important overhead cost. And a separate overhead cost commonly is approved for the taxes that are paid during the construction period.

Overhead services can be lumped together so that a single valuation is computed. If they are put together, the overhead costs of a plant usually are expressed as a percentage of the tangible property valuation. This percentage ranges from 10 to 20 per cent of physical plant value, and is commonly about 15 per cent. We should use the past tense when we speak of these lump-sum valuations; they once ranged between 10 and 20 per cent and centered around 15 per cent of physical plant value. This kind of overhead service valuation was accepted during the best days of reproduction-cost valuations and the Smyth standard. But such a property valuation, like reproduction-cost evidence, was rejected after 1930 by many commissions. After accounting systems were revised in the thirties and the original-cost rule of property accounting was instituted, commissions usually demanded some cost evidence of overhead services. They began to close another loophole in earnings regulation, eliminating or questioning the accuracy of lump-sum valuations of overhead property items.

Working Capital. When commissions compute the property values on which utility companies deserve a return, they are concerned chiefly with fixed assets. But the fixed-asset valuation does not quite cover the whole tangible property valuation. Like unregulated companies, utility enterprises need a stock of materials and supplies, cash funds for the payment of wages and other current expenditures, and a reasonable bank balance. This is the necessary working capital of a utility firm. For regulated companies the working capital should not be determined by deducting the current liabilities from the current assets. Some of the cash funds or other current assets are not rightly included in the rate base; earmarked cash funds, such as depreciation funds or sinking funds, and cash funds for dividend payments are not includible. Nor can the commissions vary the working-capital allowance as a company's need for supplies and cash varies from season to season or day to day. The commission must make, instead, a reasonable average estimate of the necessary working capital of a company. This property valuation is a judgment figure that varies with the kind, size, location, and pricing practices of the companies.

A SUMMARY

Judged by its legal history, the reasonable valuation of public utility property is a tough old bone on which many have chewed without getting good and satisfying results. By this time it shows the marks of first a hopeful and then a disillusioned Supreme Court, of acquisitive managerial interests who exploited the Smyth rule for all it was worth before 1930, of valuation engineers who like to make money out of valuation studies, of commissions that finally are enjoying administrative authority and can make the companies uncomfortable under the Hope decision. The meaning of reasonableness, which is always something less than perfectly clear and conclusive in a democratic society, is more confused than crystallized by so many different gnawings on the valuation bone. Some secondary matters such as used and useful property or valuations for working capital and land already seem to be quite well settled by acquiescence or judicial opinion, but a reasonable definition of tangible property value still is disputed. The Supreme Court has, I think, the elements but not the refinements of reasonable regulation in the Hope decision; at least it centers attention on the primary question of reasonable earnings rather than reasonable property values, and is in a good position to reorient commission behavior in future decisions. Yet, our society still is so attached to private property values that the Court may not be able to keep away from them as further cases come to it.

Chapter 13

A Review of Valuation Standards

COMPANIES, COMMISSIONS, and courts always have agreed on one fact about earnings regulation: the prices of utility service should be high enough to give investors a reasonable return. Neither the regulators nor the jurists have expected the investors to contribute their capital for nothing. The commissions and courts usually have tried to choose rational methods and rational purposes of public utility regulation. But though they have agreed on the necessity of a return, they have disagreed on the measurement of it. The main point of the conflict was the valuation of property, the relationship of the fair return and the property value. For nearly a half century the Supreme Court found this relationship in the Smyth rule. A fair return was based on the fair value of property that was compounded somehow from original-cost and reproduction-cost valuations. Then in the Hope decision the Court, like a mellowing man who relaxes and tempers his convictions, turned away from the unclear standard of the Smyth case. The commissions were given control of the method of earnings regulation, and were allowed to choose whatever property valuation standard they wanted. Commissions could ignore evidence of reproduction-cost valuations; the Smyth rule of fair return control was gone; and the Court looked for reasonable earnings rather than fair property values.

The whole story of the search for a relationship between property values and fair returns is not told in Supreme Court decisions. When the Supreme Court decides a rate case, it does not discuss the total social effects of alternative decisions—the effects on the efficiency of commissions, the future output of service, and further investments in utility plants. Remembering the history of the Smyth rule, we can say that a fair value of property is fair because the Supreme Court says it is; nothing is said about constricted regulation, the limits of service, or attraction of future investments. If the dissenting opinions of Justices Brandeis, Stone, and Black are excluded, the decisions of the twenties and thirties usually pass over economic and administrative questions about reproduction-cost valuations. The costliness and protraction of reproduction-cost studies, a realistic definition of reproduction cost, maintenance of real investment values—these and other matters are described superficially or are not discussed at all. Now the Court accepts the fair returns that are based on original-cost valuations of property, but it does not bother to explain why such valuations are reasonable bases of control. Members of the Supreme Court do not say what the effects of an original-cost base will be on service production, investments, and future prices; they do not forthrightly approve this base, though the majority of the Court does let the commissions choose the methods of control. The legal meaning of a reasonable property value still is not clear. Yet from a half century of experience with fair, original-cost, and reproduction-cost valuations we can learn something about the administrative troubles and economic characteristics of different property valuations. The Hope decision solves the valuation problem for the present, but it does not stop discussion of alternative property valuations for earnings regulation.

Two general criteria influence the choice of a good valuation standard. One of these is the workability of the relationship between the property value and the fair return. Seeking a convenient property valuation, commissions consider the cost and speed of valuation measurements. They would base the fair return on the property value that is most cheaply and most quickly computed. As a further fact of a workable standard, the valuation must be adaptable to the knowledge of American utility commissioners. Being common men who either have a limited understanding or have no understanding at all of utility controls as they start to regulate, the commissioners want a simple rather than a complex relationship between the reasonable return and the property value. Their first interest is the administration of earnings control; procedure takes precedence over purpose. (I do not mean to suggest that any commissioner can be or should be purely rational.) This administrative criterion is likely to become paramount unless the Hope decision is reversed or modified. Leaving the choice of regulatory procedures to commissions, the Supreme Court can be sure that convenient, aggressive, matter-of-fact administration of control is stressed. The Hope decision reflects, in fact, the force of an ascendant administrative government.

The other general criterion is the effect of earnings regulation on plant expansion, plant replacements, innovations, and miscellaneous service improvements. How do the fair-value, original-cost, and reproduction-cost bases of earnings control affect the investment decisions of utility companies? Can the service limits be expanded furthest when the fair return is based, for instance, on the original cost of used and useful property? If it can, an original-cost valuation not only has administrative advantages, but also serves the economic ends of regulation. This criterion calls for a valuation base that accounts fully for the total service costs and measures them as investors think best. As long as investors and company managers control the rate of plant reinvestments, construction of new plant, and installation of technical improvements, the commissions and courts must play along with investors' expectations, curbing the acquisitiveness of private companies but not restricting the willingness to invest.

A property valuation, taken alone, obviously does not determine the fair return. If the conventional procedure is followed, the property valuation must be multiplied by a rate of return to measure the fair return. Looked at objectively, neither the property valuation nor the rate of return is the controlling factor. The reasonable property value and the reasonable rate of return are complementary. If regulators and judges are attentive, moreover, to the economic effects of earnings regulation, they concentrate on the reasonable earnings. In determining a reasonable return, a commission does not even need a property value, which is a convenient and conventional factor of earnings control, but not an indispensable part of the regulation.

If a property valuation is not used in earnings regulation, the return is based on the estimated earnings expectations of investors and is high enough to maintain a certain amount of service, or to achieve a certain plant expansion or plant improvement. Regulating earnings according to investors' expectations, courts and commissions must study the conditions of investment decisions—the future operating costs, taxes, interest rates, technical changes, output plans, and consumer demand.* And they must find or anticipate a relationship between these general investment conditions, which are not certainties, and the possible investment plans of individual companies. The managers of utility companies, like other private companies, unquestionably relate their investment decisions to investment conditions—the foreseeable as well as the uncertain conditions. But the relationship is not definite; it cannot be translated readily into an annual fair return. If earnings control is based on private investment conditions, courts and commissions have a proper perspective of reasonable regulation; they have a long view of the regulation. But they do not have a definite and simple standard with which the reasonable earnings can be quickly and easily calculated from year to year.

Courts and commissions are interested, of course, in continuation, expansion, and improvement of utility services; they want to encourage reinvestments and new investments in utility plants. They say that the allowable return should be high enough to attract capital to prospering companies. But they do not make careful studies of investment conditions, and try to discover how much new investment can be anticipated with different amounts of earnings. Courts and commissions do not clearly tie up reasonable earnings control with investors' expectations. That relationship is too speculative for them. Since the future conditions of operation are not certainties, the investors' anticipations of costs and revenues are not definite and stable. The expectations of utility-company managers can be more uncertain, indeed, than the uncertain facts of future cost, technical, demand, and regulatory conditions. Shifting estimates of an uncertain future are not attractive to regulators. Although they are interested in what can be called equitable regulation, they want a definite procedure of earnings control. They want to base the fair return on some current, factual valuation of useful property. Book valuations of property and current financial obligations are bound to be the most common facts of reasonable earnings control as long as more pertinent facts are uncertain and elusive. A fixed property value is an important part of fair-return control, because the common practices of commissions and courts make it important.

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* The relationship of investments and earnings control is discussed in the last half of Chap. 17.

FAIR VALUE

After 1890 the Supreme Court was the final legal authority in earnings control, and it decided what was and what was not reasonable regulation. Since the property values of private companies were at stake, the Court quite naturally chose a property value standard of reasonable earnings prior to the Hope decision. Considering the Fourteenth Amendment to the Constitution, the Court decided what property could be "taken" by "due process of law." The concept of a fair property value developed. In the Hope decision the Smyth v. Ames definition of fair property value was disregarded. Perhaps the phrase "fair value" or some synonym will not appear again in Supreme Court decisions. Perhaps the Court, dissatisfied with the general measure of reasonable earnings in the Hope case, will be compelled to redefine a fair property value and to use it again as a standard of earnings regulation. The rationality of regulation —rational choices of means and ends of regulation—is not yet a settled fact. As long as new facts and new situations appear, regulatory action seems likely to change, but it cannot afford to abandon altogether the concept of reasonable or fair control.

The Idea of Reasonable Value. If you ask a student of public utility regulation the meaning of fair property value, he often recites the Smyth v. Ames rule. He tells you that fair value is determined by giving "consideration," in some way, to both the original-cost and reproduction-cost valuations. Repeating the Smyth rule constantly for more than four decades, the Supreme Court made it the standard definition of fair property value. But the Smyth rule is not the only conceivable definition of fair property value. The Supreme Court can choose some other measure such as original cost, the cash paid in by investors, or some kind of reproduction cost.

John R. Commons offers a general explanation of the Supreme Court's concept of reasonable or fair property value.[1] Like the public utility concept, the rule of reason in antitrust decisions, and numerous other ethical distinctions of the Court, the fair property value is the Court's judgment of what balances the conflicting forces in regulation. The reasonable-value concept is designed to create a state of order for earnings control. As Commons says,* "What is wanted is not truth but orderly action."[2] Commons is not unmindful of the Court's responsibility for justice; rather, he means that some rules and standards are necessary for continuous, orderly conduct. Since the Court believes that it is responsible for orderly and just action, it selects a standard of property value and reasonable earnings. Being the highest legal authority of the country, it fixes an authoritative method of property valuation as it did in the Smyth v. Ames decision. Thereafter the standard is fixed, and commissions and companies must respect the standard until it is changed by the Court. In a practical sense the reasonable value of public utility property is what the Supreme Court, looking for an equitable and orderly pattern of regulation, says it is.

Reasonable value, as Commons says, "is the common sense definition under which all rational and semi-rational beings operate as best they can."[3] A valuation is not really reasonable just because the Supreme Court says it is; the Smyth standard, for example, did not always have reasonable effects on consumers, and an original-cost standard may not always have reasonable consequences for investors. Yet the Supreme Court has both the power and the ability to choose a method of property valuation. Judged by the rational attitude of the Court rather than the legal history of valuation cases, a reasonable valuation of public utility property balances (as Commons suggests) the conflicting interests of buyers and sellers, restricting both the prices that a company charges and the earnings reductions that regulators can force on a company. It usually seems to be a sort of "middle-of-the-road" choice between exploitation of consumers and confiscation of private property—a compromise between the sovereignty of the legislature and unlimited liberty of property owners. A utility company does not determine prices, fixing either full monopoly prices or "break-even" prices as it pleases. It does not have an unlimited liberty to fix prices. A reasonable valuation of public utility property is not a capitalization of what the economist calls the monopoly return; nor is it a capitalization of existing earnings. A reasonable valuation of property neither protects utility companies against any price reductions nor gives unlimited price reductions to the consumers.

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* Quoted by permission of The Macmillan Company, publishers, from *Institutional Economics*, p. 712.

The reasonable-value concept protects the utility companies against the free use of legislative and regulatory authority. A minimum return is fixed for companies, safeguarding private investors against the acquisitiveness of buyers and the aggression of regulators. The Supreme Court apparently used the reasonable-value rule because it could not trust legislatures and commissions to fix and to maintain an equitable standard of earnings regulation—because the legislature or commission might take a short view of earnings regulation, disregarding depreciation costs and investor returns and jeopardizing the continuation of private utility service. A reasonable property value and a reasonable amount of earnings were designed to protect private property owners, to induce some uncertain amount of private investments in utility operations, and to maintain private ownership of utility enterprises. This rule developed before the First World War when corporate enterprises grew rapidly, and when the faith in private enterprise was strong. It was consistent with capitalism because it required respect for private property and private enterprise. And as long as the private property and private enterprise last, the idea of a reasonable property value can have a place in utility regulation and judicial review.

Defects of the Reasonable-value Rule. If a person accepts private production of utility services, he must accept, too, the general concept of reasonable earnings. He can scarcely object to the general idea of tolerable limits of public utility regulation, to the balancing of buyer and seller interests. And a corollary idea surely is accepted: a sufficient return for investors so that the company managers are induced to make replacements, improvements, and even enlargements of utility plants. The concept of a fair return on a reasonable property valuation, fixing a general relationship between government action and private business, seems to be an acceptable general standard of earnings control. But a general standard is not enough. Commissions need working rules of reasonable earnings control; they need a translation of the general idea into measurable costs and revenues. This is where the general concept of a reasonable property value breaks down; no single, definite measure of reasonableness is evident. At least that is where the Smyth rule of a fair return on a fair value ceases to be a reasonable standard of regulation.

The Smyth rule seems to be nothing more than a simple compromise between original-cost and reproduction-cost valuations, nothing more than some average of dissimilar factual valuations of private property. In this case the term "fair value" is only a "soothing phrase," a way to cover up the difficulties of reasonable property valuation and to avoid future commitments. As Judge Learned Hand says,

> Values shall in each case be determined at sums which will not too much outrage the susceptibilities of either side, by the comforting doctrine that all principles, however conflicting, shall have a just recognition. [This is] not the first instance of man's escape from thorny questions of dialectic by a plea for a sacred spirit of tolerance, even the tolerance of contradictories.[4]

The judicial standard of reasonable property valuation seldom was closely related to investment decisions, future expansion of utility plants, and other economic considerations. For two decades after the First World War the Smyth rule was ceremoniously repeated in many decisions; the Supreme Court did not check its experiences and try to improve the measurement of reasonable returns. When the rule was in force, the Court wished to solve immediate conflicts between the regulators and utility companies. At the same time it wished to protect the property rights that the companies possessed. Focusing attention on the existing property and the current earnings, the Court neglected the relationship between current regulation and the future rate of investment in utility operations. It desired a more definite measure of reasonable returns than one that was based on the uncertain demand, cost, technical, and regulatory conditions of private investments. Looking for a more certain measurement, the Court relied on immediate facts about property values. But it still had an imperfect measure of reasonableness—even an inequitable measure in some cases.

The main trouble with the Smyth standard of reasonable earnings regulation was not the omission of a broad social view. It was, rather, the burden that was placed on commissions. This standard was too indefinite, too cumbersome for the regulators who were expected to administer utility regulation. No one knew what was the fair value of the property of a utility company. The Court refused to say how much weight should be given to the original cost, reproduction cost, and any "other" relevant factors. It refused to limit the measurement of fair property value; the fair valuation of the property of a company always was an uncertainty until the Supreme Court officially determined it. And the fair-value rule was known, consequently, as the "trance" method of property valuation.

The Smyth rule failed to achieve its main legal purposes: it did not create an intelligent state of order and justice in utility regulation. If a commission gave some consideration to a reproduction-cost valuation and then ordered a price reduction, the company could appeal to the courts and hope for more consideration of reproduction-cost evidence. As long as the fair value of a company's property was unknown until the Supreme Court determined it, the companies were encouraged to appeal their cases to the courts. Commission decisions could be appealed to the district courts, the circuit courts, and finally to the Supreme Court before companies were forced to submit to a price reduction. Many companies took advantage of the trance method, appealing any significant decision to the courts.*

REPRODUCTION-COST VALUATIONS

Utility companies and their servants, the valuation engineers, have strong preferences for reproduction-cost valuations of property. A managerial attachment to these valuations still is evident despite the Supreme Court's decisions in the natural gas cases; indeed, the wartime and postwar increases in construction costs, which are based primarily on higher wage rates, are likely to bring forth new demands for reproduction-cost valuations. This preference stems primarily from a desire to protect the existing earnings. Since the reproduction-cost valuations often can be manipulated so that they are higher than the original-cost valuations, companies usually can make stronger defenses of their earnings when the fair returns are based on these values of useful property. Reproduction cost is a façade behind which the utility companies try to hide excessive earnings. Seeking a rationale for the façade, the companies usually say that a reasonable rate of return on the reproduction cost maintains the real income of investors. But they do not mention, of course, the unreal definition of reproduction cost, the expense of valuation studies, and the delays in earnings control.

Unreal Measurements. Replacement of utility plants is a continuous process. Replacing small property items quite regularly and large equipment units now and then, all companies reinvest continuously in buildings and equipment. Either they replace deteriorated and obsolete equipment, or they do not maintain efficient operations. Yet, even though plant replacement is an accepted fact for a successful company, the total reproduction cost is unknown. Only a small part of the real reproduction costs are incurred now; most of them will come in the future. If the reproduction cost of a plant is defined realistically, it is the prospective cost of replacing the present service capacity. It is the reinvestment cost that is incurred at various future times. But future reproduction costs cannot be predicted accurately. Even though the remaining service lives of different parts of a plant can be estimated reasonably well, no one knows just what the construction costs and equipment prices will be five, ten, twenty-five, or even fifty years from now. Nor can anyone predict capital-saving innovations for public utility plants. Lacking facts about future plant costs, companies and commissions cannot make realistic measures of the reproduction costs of property.

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* The Johnson Act, which Congress passed in 1934, affords the state commissions some relief from litigation.[5] When a commission's rate order does not interfere with interstate commerce and when a "plain, speedy, and efficient remedy" is available to companies in the state courts, the federal district courts do not review the public utility cases.

Even though they cannot measure the future replacement costs, utility companies and valuation engineers still are interested in reproduction-cost valuations. They adjust the measurement of reproduction costs to the available facts, and are not disturbed by their unreal valuations. Measuring what the available facts allow them to measure, managers and valuation engineers usually calculate the current replacement costs of existing plants. A property inventory is assembled, the current prices or averages of recent prices are collected for construction work and equipment, and the prices are multiplied by their respective property items to determine the reproduction cost. This is an imaginary cost. Utility companies never actually replace whole plants at once. And when they do replace parts of their plants in the future, they usually pay more or less than the present prices of equipment. If economical plant improvements are available, the companies do not purchase the old kinds of equipment. If utility companies must have reproduction-cost valuations and cannot measure future replacement costs, they still measure what they can measure—the current reproduction costs. But the costs of imaginary, current reconstructions of plants are poor substitutes for the actual future replacement costs.

Reproduction-cost valuations depend, in part, on the judgments of appraisal engineers. Sometimes the valuations are hastily made, and the replacement costs of each building or piece of equipment are not carefully studied. These valuations may be little more than "horseback" appraisals. Other reproduction-cost valuations are detailed, extensive investigations. Yet if the appraisal engineers compute even detailed valuations, they must make estimates of some construction costs and equipment prices. The current replacement costs of buildings, for instance, always are estimates. Since the appraisal engineers cannot simulate the competitive bidding of contractors, they compute the reproduction costs of buildings and other equipment with wage rates, raw material prices, guesses about contractor profits, and the estimated costs of using construction equipment. Even the wage rates and raw material prices sometimes are approximated. Wage rates are not available for all kinds of labor and all locations of laborers. Prices must be estimated, too, for special kinds of equipment or for equipment that is not manufactured.

The final valuations of reproduction costs are based partly on facts and partly on engineers' judgments.

The Cost of Valuations. Reproduction-cost valuations are expensive. One engineer estimates that the price of a "simple" reproduction appraisal is from one-third to two-thirds of 1 per cent of the final valuation.[6] For small companies the cost of valuation studies may be higher—as high as 1 or 2 per cent of the final valuations. During the twenties the New York Telephone Company paid $6,000,000 for property inventories and reproduction valuations. And the New York Edison Company paid about $5,000,000 for a valuation.[7] These expenditures showed how much the companies endeavored to protect their earnings. Prior to 1930 the prospering companies could better afford the high prices of property valuation studies than was possible for the commissions. No state commission could afford to spend $1,000,000 a year on reproduction-cost studies. Laws were passed later that allowed many commissions to assess regulatory costs to the companies. Even so, the high costs of valuation studies still were limitations of earnings regulation. When the costs to the companies were assessed, the excessive earnings were reduced and consumers received smaller price reductions. Reproduction valuations of utility properties always were a high-priced means of earnings control.

Delays of Regulation. While commissions and companies measure the reproduction-cost valuations, price changes are put off. Even a simple reproduction-cost study often takes a year or more. And when the valuation engineers start from scratch, building up the property inventory and computing construction costs and equipment prices for the first time, a thorough study may require several years of work by a sizable engineering and accounting staff. If equipment prices and construction costs change considerably in a year or two, a valuation study is out of date before it is completed. The restrictive effect of reproduction-cost valuations was illustrated by a protracted controversy about New York telephone rates. Before 1936 the New York Commission and the New York Telephone Company were in continuous conflict for twenty-three years.[8] Computing reproduction costs and settling many conflicts about valuation evidence, the New York Commission and the telephone company set a record for delayed and litigated regulation. And the company lawyers even took two years to prepare a 5,700-page brief for a Supreme Court appeal. This was admittedly an exceptional protraction of commission regulation. Yet, when the Smyth rule was in force, the regulatory work of other commissions, too, was delayed by reproduction-cost valuations. During the thirties the commissions frequently spent from one to three years on important rate cases.[9]

These delays in commission regulation can be reduced in several ways. When continuing property records are required by commissions, one step of a reproduction-cost study, the compilation of a property inventory, is unnecessary. Second, when an earnings and rate decision is delayed, some commissions have authority to order temporary rate changes. Time can be saved, furthermore, by fixing rules for the submission of evidence. Hearings of expert valuation testimony, particularly under the Smyth rule, often consumed much of the time of a commission. Some evidence can be submitted prior to the time that the witnesses are called for testimony.[10] The length of the brief can be limited and evidence can be confined to matters of fact; voluminous valuation evidence is not necessary for wise commission decisions.[11]

If reproduction-cost valuations are made, index numbers rather than engineering appraisals can be used to compute them. This is not a common method of property valuation. Some engineers compile construction-cost indexes for whole utility industries.[12] But these indexes are designed to give general price information, not to measure property valuations for earnings control. Valuation engineers, attempting to bring old valuations up to date, sometimes use index numbers to compute what they call "trended" appraisals.[13] These trended valuations are used now and then in commission cases, though the engineers still prefer direct studies of reproduction costs. Before the Smyth standard of property valuation was repudiated, the Supreme Court did not approve fair values or reproduction-cost values that were computed with index numbers. Deciding the Chesapeake & Potomac case in 1935, the Court rejected the Maryland Commission's use of index numbers. This was not a good legal test of index-number valuations, because the Maryland Commission did not have the right kind of index numbers. If this method of valuation is properly used, a separate index number or set of index numbers is computed for each plant or company.

Constructing good index numbers for reproduction-cost measurements, a commission must follow a definite methodology.[14] First, a base valuation of the property is computed. Next, percentage relatives of applicable material prices, equipment costs, and wage rates are assembled. Sometimes these price data must be approximated, though the approximations need not be more numerous than in engineering appraisals. The percentage relatives of prices, weighted according to the base-value significance of the property to which they apply, are combined to give a composite reproduction-cost index of the property that is used at a certain time. This main index, however, does not take account of property additions and abandonments; a separate index series is constructed for the abandonments and the property additions of each year.* Every five or ten years a new main index can be formed: the old main index can be combined with the several indexes for plant abandonments and additions. These index numbers do not have the defects that the Supreme Court found objectionable in the Chesapeake & Potomac case.[15] In this case the Maryland Commission used a miscellany of price indexes to translate an old fair property valuation into a current fair valuation.† Unlike the Maryland indexes, a true index of construction costs is based on the property values for which the index is computed.

Maintenance of Real Income. Utility company managers and private valuation engineers ordinarily did not give much attention to theoretical, objective reasoning about a reasonable return during the days when property valuations were a common cause of controversies. Since the Supreme Court insisted on consideration of reproduction-cost evidence as the earnings were determined, the companies based their arguments on the decisions of the Court. Being interested primarily in the legal status of reproduction-cost valuations, they took advantage of the Smyth rule, and rarely troubled themselves with economic or social reasoning about earnings regulation. They were not students of earnings control who had nothing at stake in the choice of a reasonable property valuation. Their interest was practical and personal. A reproduction-cost valuation was useful: it often thwarted or modified the aggression of commissions. Protection of earnings came first; arguments for or against property valuations were secondary. Managerial thoughts on earnings regulation were subordinated to the acquisition of earnings and the payment of dividends.

Utility-company managers are willing to accept a useful argument. They like the argument that a return on a reproduction-cost valuation maintains the real income of investors.[16] This is the main nonlegal argument for a return on a reproduction-cost valuation.‡ If the fair return is computed by multiplying a rate of return by an original-cost valuation, the money income of investors is stable from year to year. But unless the general price level never changes, the real income of the investors is unstable. The purchasing power of a fixed money return varies, of course, with changes in commodity prices. On the other hand, when the return is based on a reproduction-cost valuation, the money income of utility investors is unstable and their real income is relatively stable. The reproduction costs of utility properties usually do not have the same amplitude of fluctuation as the general commodity prices. But plant replacement costs tend to rise or fall as general commodity prices rise or fall.

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* In any year the reproduction cost of a company's plant—exclusive of working capital, going value, land value, overhead costs, and the deduction for accrued depreciation—is determined by multiplying the main index and each index of property additions by their respective base values, less the sum of the annual indexes of abandonments by their respective base values.

† The Maryland Commission used sixteen indexes of general prices and construction costs. These indexes ranged from the wholesale price index of the Bureau of Labor Statistics to an index of Western Electric prices. Arbitrary weights were assigned to each index. Then the composite index was used to translate a fair property valuation of 1923 and the cost of subsequent property additions (less property abandonments and accrued depreciation) into a fair value in 1932. The Supreme Court rightly objected to this strange method of reproduction-cost valuation.

‡ According to another economic argument, a reproduction-cost basis of earnings control is a way to simulate competitive price control.[17] But "normal" competitive prices and returns are the result of perfectly equilibrated economic forces, of the interaction of numerous rival sellers. The conditions of perfect or pure competition are not comparable to public administration of an isolated utility company. A reproduction-cost valuation is an administrative basis of earnings control; it is chosen by the companies, and is computed by valuation

Using the real-income argument, an economist or utility-company manager wants to stabilize the purchasing power of investor incomes so that the flow of investable funds is not disturbed. This argument singles out one consideration of investors: the incomes from alternative investments. When an investor buys securities, he takes account, of course, of alternative investments. He considers not only the risks of default (loss of capital), but also the possible future changes in alternative interest rates and dividend payments. If the future dividend payments of one stock issue are stabilized while those of another are likely to increase, investors naturally discount the price of the stabilized-return issue relative to the other issue. This kind of reasoning is used to support the real-income argument for reproduction-cost valuations. Increases in the general price level and in the earnings of nonutility firms generally go together. Dividend payments on nonutility stocks commonly increase during a period of rising prices. When the dividend payments keep pace with general commodity prices, the real income of the security holders is maintained. Unless the real incomes of utility investors are related to those of nonutility investors, utility securities may become less attractive investments.

The real-income argument has several defects. No distinction is made, for instance, between different kinds of real-income changes. A temporary change in real-investor income differs obviously from a permanent change. Cyclical changes in the real incomes of public utility investors may not affect investments in utility operations. Investors know that utility companies usually have more stable earnings than nonutility companies, that dividend payments of nonutility companies commonly increase more during prosperous times and decrease more during a business collapse than the dividends of utility companies. From year to year they do not expect equivalent money incomes from utility and nonutility stocks. Instead, they consider the general and long-period relationship of

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engineers. It is a managerial rather than a market-place valuation, an arbitrary rather than an objective measure of property value.

the returns from different securities. A permanent or secular change in production costs and general prices attracts the attention of investors. If collective bargaining of laborers, exhaustion of low-cost supplies of natural resources, the farm price program of the federal government, or national monetary policies seem to give an upward bias to the price level, the money income of utility investors probably should increase too. It ought to increase as fast as the earnings or dividends of nonutility companies increase. But public utility investors do not seem apprehensive now about a general, permanent price inflation. Utility companies usually are able to sell large amounts of bonds and notes; the high bond-stock ratio of utility companies disproves the real-income argument.

This argument implies that the property valuation is the only important variable of earnings regulation. It implies that the fair rate of return is firmly fixed. But the rate of return is not inflexible. Regulators can increase or decrease it as the cost of capital changes; they can stabilize the property valuation, and vary earnings by altering it. If the opportunity costs of utility investments are increasing, the earnings can be increased; if they are declining, the earnings can be reduced. This point can be summed up this way: when the fair return is based on the original cost of property, the money income of investors is not necessarily stable.

Next, the concept of reproduction cost is different in this argument from that in valuation practice. The Supreme Court defines reproduction cost as the current cost of replacing the existing plant under the original conditions of construction. This legal definition calls for a valuation that is measured with material prices, wage rates, equipment costs, and other prices for the established plant. But the real-income argument is concerned with the purchasing power of investor incomes. The purchasing power of common-stock dividends is measured by general commodity prices, not by construction costs of utility-company property. The wholesale price index of the Bureau of Labor Statistics, for instance, is a better measure of purchasing-power changes than engineering appraisals. Yet the Supreme Court says that general commodity prices are not proper measures of the reproduction costs of utility-company properties.[18] The real-income argument does not conform to legal reasoning.

Gains for Stockholders. The real-income argument also neglects the fact that only common stockholders get benefits from reproduction-cost valuations. Since the periodic returns of debt holders and preferred stockholders are fixed, an enlargement of earnings can be used altogether to pay higher common-stock dividends. Suppose that a utility company issues the following par value amounts of securities: $1,200,000 of 3.5 per cent debt securities; $500,000 of 5 per cent preferred stock; and $500,000 of common stock. The annual interest and preferred dividend payments are $67,000. If the original cost of property is $2,300,000, a 5.5 per cent rate of return gives the company a total return of $126,500 and a return of 11.9 per cent on common stock. But reproduction-cost valuations commonly afford an opportunity for a higher return. If the reproduction cost of company property is $3,000,000 and the rate of return is still 5.5 per cent, the fair return is $165,000 and the return on common stock is 19.6 per cent. This simple example explains why utility firms are so interested in returns on reproduction-cost valuations. The owners of the common stock are the real beneficiaries of the reproduction-cost standard of fair return control, and they naturally are the strongest proponents of the standard.

ORIGINAL-COST VALUATIONS

As long as the Hope decision is in force and commissions can fix the methodology of earnings regulation, the fair-return measurements commonly can be based on original-cost or investment-cost valuations of property. Commissions do not compute imaginary reproduction costs of public utility plants; nor do they follow the Smyth rule of fair-value determination. Original cost is the customary, semiofficial valuation of public utility property. Original cost does not mean the same thing to all people. There are three related cost standards of property valuation: investment cost—the actual cost to the existing company; prudent investment—the investment cost which is adjusted for unwise or fraudulent investments; and "first" original cost—the cost of property when it was first devoted to public utility service. The first original cost, which often is lower than any other cost valuations, is a currently popular measure of property valuation, but it is not always a reliable measure of reasonable earnings. It may afford a greater reduction of earnings and prices than any other valuation, but price reductions can be either unreasonable or reasonable according to their investment and production effects. And the first-cost standard of valuation can prevent some property acquisitions that improve managerial efficiency or enlarge the output of service. The purpose of this section, however, is an examination of original-cost measures in general rather than the first-cost standard in particular.

A Convenient, Inexpensive Valuation. Unlike fair valuations and reproduction-cost valuations of property, a first-original-cost or investment-cost valuation can be determined easily. No other characteristic of these valuations is so significant. Using the present accounting regulations, commissions can readily determine the cost of the property of each company. Now the companies follow the accounting definition of original cost, recording the book values of their properties at the first original costs. Write-ups and other fictitious additions to book values of property are segregated from other asset values. The book values provide nearly all the information for investment-cost valuations. After they assemble the book values of useful property, commissions can determine the investment additions to the first-original-cost values. If they seek a prudent investment value, they study the past investment decisions of utility companies and adjust the actual investment costs of property.

An investment-cost, first-original-cost, or prudent-investment valuation is a convenient factual basis of earnings control. It is one of several precise, determinable facts on which some students and regulators wish to build an administrative or accounting pattern of earnings control.[19] Contrasted with other valuations, an investment-cost valuation is not based on judgments of appraisal engineers, commissioners, or judges. Sometimes the companies and commissions are bound to disagree about imprudent investments or reasonable additions to the first original cost. Most of the valuation information is obtained, however, from accounting records. Second, because the original-cost, investment-cost, or prudent-investment valuations of separate property items do not change and are easily kept up to date, commissions can undertake more investigations than with reproduction-cost valuations. Third, the expenses of earnings investigations are low when accounting records provide most of the data. Fourth, since companies and commissions seldom have disputes about these valuations, only a few commission decisions are appealed to the courts. The investment-cost, first-cost, or prudent-investment valuations facilitate the administration of earnings regulation. They give the regulators definite, accessible facts that expedite the administration of rate cases.

The Investors' Sacrifice. As writers frequently point out, a return on an investment-cost valuation rewards investors in proportion to their sacrifices. Taken literally, this is a truism. The investment outlay is the sacrifice; a return on it is equal, except for occasional adjustments, to the return on the investment-cost valuation. This idea concerns more than the formulas of earnings regulation; it directs attention to the fairness of a return on an investment cost. (Unless the present company never pays another utility firm more than the original investment cost of property, this idea is not applicable to a first original cost of plant.) When investors receive a return on the investable funds that they lend to utility companies, they get everything that they expected at the time of their investments. The holders of fixed-return securities do not lose anything when a return is allowed on the actual cost of property. The bondholders and noteholders get the same amount of interest as when the return is based on a reproduction-cost valuation. Likewise, the holders of the nonparticipating preferred stock of a prospering company never can expect more than a fixed return, though an increase in earnings sometimes gives them more assurance of future dividends.

The common stockholders are affected by the choice of a valuation base. If the return is based on a reproduction-cost valuation and is larger than a return on an investment-cost valuation, the whole difference goes to the common stockholders. The "sacrifice" argument, therefore, is directed principally at the common stockholders. When common stockholders are rewarded in proportion to their sacrifices, they receive dividends or additions to earned surplus that are based on their original-return expectations. As each successive investment decision is made during the history of a company, the stockholders relate their return expectations to the immediate investment outlays. At the time of an investment decision the return expectations are expressed in relation to the new, additional investment cost. If investors are apprehensive about increases in plant construction costs, their reaction is expressed in the lower prices that they are willing to pay for the new common stocks. If they anticipate decreases in demand, careful or even ruthless regulation, or relatively higher dividends on nonutility stocks, they also reduce the prices that they are willing to pay for the common stocks of utility companies. A return on an investment cost or prudent investment valuation approximates the historical expectations of stockholder returns. The dividend expectations of common stockholders can change, of course, after the common stocks are sold. If they do, the rates of return rather than the property valuations can be increased (or decreased) to account for the new expectations. At least a return on a reproduction-cost valuation is a clumsy, expensive way to account for new dividend expectations.

Uses of Resources. Some persons say that a return on an investment-cost, first-cost, or prudent-investment valuation can lead to an inefficient allocation of economic resources.[20] If a return on such a property valuation keeps down the utility prices while other prices are increasing, the demand for utility services (according to the argument) increases more than the demand for other commodities. To satisfy the new wants of their consumers, utility companies must expand their plants. The rate of new investment in utility enterprises is higher than that in nonutility industries. A disproportionate amount of economic resources, consequently, are allocated to utility operations. And when utility prices do not decrease as other prices fall, resources are supposed to be allocated inefficiently in the other direction. Drawing customers and sales from the utility companies, the nonutility industries experience increases in demand and income; the capital investments of the nonutility industries expand, while the utility plants stop growing and begin to contract.

This argument against the use of original-cost valuations is unreal. The history of earnings regulation and utility prices does not support the argument. A disproportionate allocation of resources to utility services is not evident today, even though utility prices usually do not fluctuate so much as nonutility prices during a business cycle. The prices of utility services, in fact, are quite inflexible, quite unresponsive to changes in national income. Except where commissions undertook more investigations, the prices did not decrease much between 1930 and 1935.[21] They did not decline much during these depression years, even though the reproduction cost of utility property still was one "consideration" of reasonable-earnings regulation. On the other hand, the prices of nonutility commodities declined sharply between 1930 and 1933. Despite the unequal changes in utility and nonutility prices, numerous buyers did not shift from utility services, to which they had become habituated, to nonutility commodities. They had income inelasticities of demand for utility services and were willing to spend larger fractions of their declining incomes on utility services.

Given the right conditions, the stability of utility prices can distort the allocation of resources. Either a hyper-inflation or a notable deflation of the general price level, which is expected to persist for a long time, can affect the demand for fixed-price services. Let us suppose that the general price level increases 400 per cent. At the same time the level of utility prices increases only 200 per cent, because the fair return and depreciation charges are based on book values or actual costs instead of reproduction-cost valuations. Only the increases in wages, maintenance expenses, raw material costs, and general expenses are translated into higher utility prices. When such a disparate change occurs between utility and nonutility prices, a considerable number of consumers may turn from nonutility commodities to utility services. More families, retailers, and manufacturers can afford to substitute gas for coal, electricity replaces other forms of power, telephone service is used more freely, and so on. But, until hyper-inflation occurs and the price disparity is evident, an original-cost basis of earnings regulation does not clearly distort the allocation of resources.

A further fact is overlooked. Utility firms do not expand their plants unless the anticipated demand, costs, and technical conditions seem to justify it. They do not invest more funds in public utility plants, as the argument implies, merely because buyers demand more service at "artificially" low prices. Companies often have sufficient unused plant capacity with which a larger output can be produced. Or they can use old, semiretired plant to serve these buyers; utility companies often have much of what is called "stand-by" plant. To meet large increases in demand, the electric firms use old generating plants, gas companies renovate the old manufacturing plants and holders, and urban transportation systems get out their obsolete busses and streetcars. At any rate, the utility firms are unlikely to build more plant and try to meet demand increases at low prices. They can "stretch" existing plant capacity a long way, as the experience during the Second World War shows, before they must build more plant or ration service.

A Limitation of "First" Cost. Basing the reasonable returns on first original costs, commissions can divert companies from more economical uses of resources. They can discourage some property exchanges that afford more efficient means of production. Suppose that a company wants to acquire property from another utility firm, but it must pay more than the first original cost. Even at the extra price the acquisition, let us assume, economizes the costs of production. If the firms are affiliates, some commissions, led by the Federal Power Commission, charge the sum above first cost to earned or capital surplus; the company's investors pay the extra price no matter what the prospective economies are.* If they are independent companies, the additional cost usually is amortized by making periodic charges to operating expenses. Unless the firm is allowed to sell its services at higher prices, it pays the amortization charges. Under these conditions the economical acquisitions of property are likely to be put off. Either the acquisition prices are bargained down until they are close to the first original costs, or the private managers pass up some chances to expand their plants and to reduce production or selling costs. The first-cost standard of valuation needs some flexibility if it is to do more than simplify accounting and earnings controls.

An Administrative Routine. The present formula—a fair rate of return on the first original cost or investment cost of property—is adapted to the knowledge of most commissioners. Common men, who have only limited knowledge of the purposes and processes of regulation, can understand these valuations better than the intricate reproduction-cost valuations. Such a cost valuation is convenient; it can be quickly and cheaply determined. But the simplicity of book valuations of property can handicap regulation in a significant way. Based on accounting data alone, earnings regulation can become a mechanical, routine process rather than purposive regulation that considers consequences and means together.† It can become a regulatory method that is not directed toward any particular end of government. A standard method is applied to all cases and all companies, and rationally chosen ends of earnings regulation, worked out generally from continuous experiences with different consequences, are neglected.

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* The meaning of first original cost, the disposition of excess value, and the relation between first-cost accounting and earnings control are discussed in Chap. 6.

† Justice Jackson, writing a dissenting opinion of the Hope Natural Gas case, warns against an accounting standard of reasonable regulation: "To make a fetish of mere accounting is to shield from examination the deeper causes, forces, movements, and conditions which should govern rates. . . . As a representation of the condition and trend of a busi-

Emphasizing administrative work and speedy completion of cases, commissions can turn earnings regulation into a clerical process that is controlled by standardized rules. They can do this if the fair return of each company is measured the same way—if a standardized or nearly standardized rate of return, say 5 or 5½ per cent, is always multiplied by the first original cost or investment cost of property when the fair return is computed. They can do it if they neglect the relation of the fair return to the investment decisions—to the expansion and improvement of service. Freed from the Smyth rule, commissions can try to do more than "go through the motions" of regulation. Accounting procedures, easily and inexpensively applied to utility companies, can become the new rituals of earnings control. If they do, commission regulation is not far advanced beyond the ceremonious use of the Smyth rule. Used repeatedly and becoming fixed parts of the regulatory habit, first-cost or investment-cost valuations can become as inviolable as the Smyth rule once was—even as useless in practical consequences. Here is another place where the grand strategy of public control should not be lost in the detailed tactics of day-to-day administration.

TOO MUCH EMPHASIS ON PROPERTY VALUATIONS

The importance of a property valuation frequently is overemphasized as a determinant of reasonable earnings. When the Smyth decision provided the criterion of reasonable-earnings regulation, the courts stressed property valuations—the fair valuations that were derived somehow from original-cost and reproduction-cost valuations. And now when commissions choose the property valuations, the primary emphasis is on some original cost of plant. Courts and commissions do not forget, of course, that a fair rate of return must be selected, and must be multiplied by a fair property value before a reasonable return is ascertained. Yet the property valuation usually receives far more attention than the fair rate of return. Students of utility regulation constantly point out that, in the measurement of a fair return, the rate of return is fully as important as the property valuation. But where the property valuation is the para-

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ness, it [accounting] uses symbols of certainty to express values that actually are in constant flux. . . . However, our quest for certitude is so ardent that we pay an irrational reverence to a technique which uses symbols of certainty, even though experience again and again warns us that they are delusive." [22]

mount factor, courts and commissions seem to forget that nothing is so important as the total return.

Like any other private companies, utility firms always have made their investment decisions in accordance with expected returns. As long as the earnings have been subjected to public control, these decisions have been based not only on the expected demand and cost behavior, but also on the expected regulatory practices. If commissions are interested in maintenance, expansion, or technical improvement of utility operations, they must not be too attentive to property valuations. A simple, mechanical computation of a reasonable return on an investment-cost valuation must not be the basic purpose of an earnings investigation. Taking a broad view of their functions, state and federal commissions relate earnings regulation to private utility investments.* They study demand, cost, and investment conditions.[25]

In the Hope decision the Supreme Court rightly puts emphasis on the result rather than the method of earnings regulation. Speaking for the Court, Justice Douglas says, "Rates which enable the company to operate successfully, to maintain its financial integrity, to attract capital, and to compensate its investors for the risks assumed certainly cannot be condemned as invalid. . . ." [26] Successful operation, financial integrity, attraction of capital—these are the proper objectives on the investor side of earnings regulation; they are good objectives, even if they are difficult to achieve. An irresponsible commission can misuse these general objectives, saying that it preserves the financial success of companies and allows reasonable earnings while it actually chooses whatever rates it wants. Irresponsible administration of government is undeniable now and then; some of it seems to be a permanent part of democratic government. Yet, even if regulators are not always fair and wise, the objectives of reasonable earnings and attraction of private capital are basic. These are more significant ends of earnings regulation than the property valuations. Trying to achieve these ends, commissions must look to the future; even if they rely on past experiences and allow enough earnings to cover the present interest and dividend obligations, they still must keep their eyes on the future demands for service, future operating expenses, and other future investment conditions. The future is more significant than the past; earnings and costs in years to come are more important than historical facts about property cost, past earnings, and recorded expenses.

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* To subordinate the place of property valuations and to broaden the scope of earnings regulation, commissions can use such an objective as that now used by the Interstate Commerce Commission. After the ICC had unsatisfactory experiences with the rule of a fair return on a fair property value,[23] Congress revised the rule in the Emergency Transportation Act of 1933 and added a minor amendment in 1940. Today Congress requires that "in the exercise of its powers to prescribe just and reasonable rates the Commission shall give due consideration, among other factors, to the effect of rates on the movement of traffic by the carrier or carriers for which the rates are prescribed; to the need, in the public interest, of adequate and efficient railway transportation service at the lowest cost consistent with the furnishing of such service; and to the need of revenues sufficient to enable the carriers, under honest, economical, and efficient management, to provide such service." [24]

Among the members of the Supreme Court, Justice Jackson clearly recognizes the secondary significance of property valuations. Dissenting from the Hope decision, he observes that price control should be related to the production of service rather than the valuation of property. "We should recognize 'price,'" he says, "for what it is—a tool, a means, an expedient."[27] The price of natural gas, he believes, should encourage the development of gas fields, deep-drilling tests, and long-distance transportation of gas. The economic and social consequences of regulation should be the primary considerations of courts and commissions. Public authorities should balance the production and consumption of utility services, relating the current and prospective consumer demand to the investment plans of private utility companies. Objecting to the Power Commission's "pre-occupation with bookkeeping and historical matter," Justice Jackson says in his concurring opinion of the Colorado-Interstate Gas case,

> Far-sighted gas-rate regulation will concern itself with the present and future, rather than with the past, as the rate-base formula does. It will take account of conditions and trends at the source of supply. . . . It will use price as a tool to bring goods to market. . . . Once a price is reached that will do that, there is no legal or economic reason to go higher. . . . If the supply comes from a region where there is such overproduction that owners are ready to sell for less than a fair return on their investment, there is no reason why the public should pay more.[28]

Commissions usually insist that earnings regulation ought to be a definite, factual process. And many students of utility regulation feel the same way. Relying on the apparent conclusiveness of available facts, commissions can undertake many earnings investigations every year. They do more regulatory work than was possible in the days of the Smyth rule. But a factual standard of reasonable earnings creates a regulatory routine, and diverts attention from the purposes of regulation. This is a real danger when commissioners wish to live a settled political life. Preferring the comfortable, quiet way of simplified regulatory processes, these men apparently rationalize the purposes of regulation and tell themselves that a return on the first original cost or an investment-cost valuation accomplishes all that they can expect to realize. They do not like the administrative discomfort of new regulatory ideas, and prefer not to deal directly with the puzzling, subtle relation between reasonable earnings and public utility investments and reinvestments—the relation between the present service prices and future service output.

When commissioners say that the relation between reasonable earnings and future-investment decisions is uncertain and difficult to control, they are right. No one can say just what effects different amounts of present earnings will have on future investments. Even the managers of utility companies do not know. Although utility-company investments are based on earnings expectations, company managers and directors cannot say today what amount of earnings will induce each future investment. Yet an earnings-investment relation is undeniable. As companies expand, maintain, or contract operations, they prove the existence of the relation. The relationship may not be clearly revealed today or in any year, but it shows up sometime.

Even though commissions cannot make exact current measurements of the relation between investments and earnings, they need not forget its existence. Exercising control over the relation, regulators can do two things: study the relation, and seek continuous control of earnings so that both past and future earnings can be a part of present earnings regulation. Knowing something about demand and cost conditions and how utility companies respond to them, commissions can perceive how regulatory action affects the investment decisions of utility companies. Now and then they can see a close connection between investments and earnings regulation. They can see how earnings reductions slow down the rate of new investments, or how liberal earnings regulation not only maintains the credit standings of companies but also encourages more plant investments. As commissions study and try to control the relation between earnings and future service production, they cannot expect exact results. Yet it is a way to temper the customary attention to reasonable returns on property values. A return on an original-cost valuation becomes something less than a hard and fast administrative rule. It is, perhaps, a first approximation of reasonable earnings that is subject to revision as the commission learns more about the earnings-investment relation—more about the minimum earnings expectations of investors.

Study of the relation is not enough. Even though a commission watches private investment decisions and tries to relate earnings control to investments and service production, it cannot be certain that reasonable earnings are prescribed at any time. Regulation of the right amount of earnings is really a long-period problem; the reasonableness of earnings is uncertain until the cost, demand, managerial, and investor behavior unfolds in the future. This is where continuous regulation of earnings (which is discussed in a later chapter) comes in. When commissions undertake investigations and plan the reasonable earnings of companies, they and the courts should recognize two conditions: the planned earnings are likely to be larger or smaller than the actual earnings, and mistakes can be made as the planned, reasonable earnings are calculated. Dealing with these conditions, commissions can include the past earnings in current earnings measurements. If past earnings are more than reasonable, the excesses are used to reduce the planned earnings; if the past earnings are deficient, the planned earnings are increased and the deficiencies are restored. Companies lose the excesses and recoup the deficiences in their actual earnings. Past, present, and planned earnings come together in continuous regulation. Looking both backward and forward in earnings regulation, commissions can compensate for their mistakes and for changes in operating expenses, buyer demands, or investment alternatives.

Chapter 14

Valuation of Intangible Property

IN PAST years the utility companies not only sought returns on high reproduction-cost valuations of tangible property, but also asked for returns on several kinds of intangible property values. At times commissions and courts were asked to allow returns on the value of franchises, patents, water rights, and leaseholds. Going value, a counterpart of the good-will value of unregulated firms, was the favorite intangible value of public utility companies. For many years commissions gave companies generous going value allowances as fair property values were determined; ten per cent of the tangible property value was a common allowance. When the Smyth v. Ames decision was the legal foundation for fair property valuations, the Supreme Court thought that a going value allowance was a necessary part of the present property value of a utility firm. And companies could use going value and some other intangible property values as well as the reproduction-cost valuations to defend their earnings—to prevent rate reductions. But when the Supreme Court shifted toward an original-cost basis of reasonable-earnings regulation, it also changed the regulatory status of going value. Now, after the commissions scrutinize and commonly reject claims for going value allowances, the Supreme Court supports them. Except for the cost of franchises, water rights, and leaseholds, reasonable earnings are based, for the most part, on reasonable values of tangible property.

FRANCHISES

Either a franchise or a certificate of convenience and necessity, or both, are necessary to the existence of a public utility firm. Possessing a franchise or certificate, a firm can occupy a market and sell utility service. It usually has exclusive control of a market, because local governments and state commissions rely on public regulation rather than competition to control prices and earnings. Only one gas, electric, telephone, or urban transportation company occupies most markets. Operating in an exclusive market or an imperfectly competitive market, a utility company can obtain more than reasonable earnings unless regulation is vigorously and expertly done; the firm obtains more than a reasonable return on tangible property value. Receiving extra earnings, the company knows that a franchise or certificate is valuable. To measure a separate franchise value, the company estimates the future earnings above a reasonable return on the tangible property value, and discounts these excess earnings at the probable fair rate of return. A franchise valuation is a capitalization of the earnings that regulators should take away from a utility firm.

A franchise valuation, which is based on excessive earnings, is out of place in public utility regulation. When a company accepts a franchise or certificate, it has a right to receive reasonable earnings. But a right to excessive earnings is not a special privilege of a franchise or certificate holder. The excessive earnings are windfalls; they are obtained because public authorities do not or cannot regulate effectively. No commission can afford to give a company a return on a franchise value that is a capitalization of excessive returns. If it does, the earnings and prices never can be reduced. A firm is entitled to a return, however, on the price that it pays a local government for a franchise. But, since franchises rarely are sold now by local governments, commissions seldom allow a separate franchise valuation as they determine the fair value of public utility property.

The legal status of separate franchise valuations was settled before the First World War. Unlike the Smyth rule for tangible property valuation, the legal rule for franchise valuation was conclusive. Utility companies were denied a separate franchise value that was based on current or prospective earnings. Considering a franchise value in the Willcox case that was decided in 1909, the Supreme Court said,

> Its past value was founded upon the opportunity of obtaining these enormous and excessive returns upon the property of the company, without legislative interference with the price of the supply of gas; but that immunity for the future was, of course, uncertain; and the moment it ceased, and the legislature reduced the earnings to a reasonable sum, the great value of the franchise would be at once and unfavorably affected. . . .[1]

The company's measure of franchise value was based, the Court observed in the Willcox decision, on excessive earnings.* Yet the Court approved a lower franchise value for another reason: in 1884 the state of New York approved a franchise valuation, and allowed the company to issue securities on the basis of the franchise valuation. After the Willcox case the valuation of franchises was not a controversial problem. In the next two valuation cases, the Cedar Rapids Gas and Des Moines Gas cases of 1912 and 1915, the Supreme Court was not asked to pass on franchise valuations.[3] Dealing with a going-concern value in the Cedar Rapids Gas case, the Court said, however, that a fair valuation of property could not be based on an ". . . advantage incident to the possession of a monopoly, so far as that might be supposed to give the . . . power to charge more than a reasonable price."[4] And when the company wished a franchise valuation in the Georgia Railway case of 1923, the Court excluded the valuation, saying the allowance in the Willcox case ". . . rested on special grounds which do not exist in this case."[5]

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* In another paragraph Justice Peckham, who wrote the Willcox decision, seemed to accept franchise values that were based on the additional earnings and market values of public utility properties. He said, "If the property which legally enters into the consideration of the question of rates has increased in value since it was acquired, the company is entitled to the benefit of such increase. This is, at any rate, the general rule. We do not say there may not possibly be an exception to it where the property may have increased so enormously in value as to render a rate permitting a reasonable return upon such increased value unjust to the public."[2]

Both the commissions and courts exclude separate franchise values from reasonable property values. But they do not always withhold reasonable returns on investment costs that are based, at least indirectly, on excessive earnings. Seeking larger markets, some electric, gas, and telephone companies paid high prices for small and often obsolete plants. They wanted the markets of the small plants. The right to occupy the markets was valuable—more valuable, perhaps, than the physical equipment of the many small municipal and private plants. And when large property exchanges were negotiated, the prices often were higher than the investment costs of the selling companies. The prices of the property exchanges were based on whatever earnings, including excessive earnings, could be foreseen. Consequently the utility firms invested indirectly in franchise privileges. And insofar as the firms receive returns today on these present investment costs, they get returns on hidden franchise values. The front door to franchise valuations is closed, but the back door is ajar.

Hidden franchise values are connected with the present accounting for public utility property. The accounting standard for property valuation is "first" original cost: the cost of property when it was first devoted to public utility service. Following this rule, state and federal commissions segregate the first original costs from the actual costs of property items; the plant accounts contain only the first original costs, and the additional sums go into adjustment accounts until they are amortized to operating expenses or are charged against surplus accounts. Property acquisitions from independent as well as affiliated companies are subject to the rule, though the extra costs of the arm's-length transactions commonly are amortized as operating expenses. Some commissions recognize that the increments above the first original costs are intangible values; yet they do not say that the values are hidden franchise values.

Some commissions do not limit the first-cost standard to accounting matters. As they regulate the earnings of private companies, they apparently believe that the first original costs are good measures of reasonable property values. The Federal Power Commission is such a regulator. Wherever this commission controls accounting practices, it intends to write off all property values above the first costs. Given time, the Power Commission will eliminate all the hidden franchise values from accounting records. Then it can deny returns on these property values—on anything above the first original costs less depreciation. Worked in this way, the accounting regulation can be used to force price reductions on utility companies.

Other commissions, being less anxious to squeeze price reductions out of companies, are not so determined to reduce property values to the smallest possible figures. They seem inclined to leave hidden franchise values alone. Taking one possible view of past transactions, they can say that "what is done is done." In a sense they, too, have a responsibility for property exchanges at higher figures than the first original costs; they had opportunities to regulate the acquisition prices, but they did not do it. Companies were allowed to negotiate property exchanges, and in many instances to finance the acquisitions with new security issues. Nothing was said about the prudence of at least the arm's-length transactions. To deny a return now on these investment costs, the commissions change the regulatory rules after the companies cannot alter their investment decisions. Ranging between extremes, the treatment of hidden franchise values, which is a special problem of reasonable property valuation, is an unsettled part of earnings control.

WATER RIGHTS

Electric, water, and irrigation companies often claim property values for their water rights, the rights to use and dispose of flowing water. Two kinds of water rights are associated with the ownership of land. One of these is the right to subsurface water, the water that can be recovered by sinking wells. The other is that of the landowner to use and to dispose of surface water, particularly that of streams and rivers flowing through the land. The common-law doctrine of riparian rights, giving water rights to contiguous landowners, is applicable in much of the United States; but the statutory doctrine of prior appropriation, which allocates water rights according to the time order of water uses, is applicable in the arid Western states.[6] And water rights can be restricted, as in the case of navigable waters or the pre-empted waters of arid states, to something less than unlimited use of the flowing streams or rivers.

Some water rights are acquired, then, with the purchase of land. But other rights, especially some of the important water rights of utility companies, are distributed by federal and state governments. Today the Federal Power Commission, controlling the power sites on navigable streams and federal government land, is the principal source of these significant rights.

The water rights of electric, water, and irrigation companies unquestionably are valuable. Electric companies must have water for steam condensation in their steam generating plants; a hydroelectric plant is useless, of course, unless falling water moves the turbines; and it is just as obvious that a water or irrigation system has only scrap value unless water is available. But a valuation of water rights does not clearly belong in a reasonable property valuation for a utility firm. The water-right value can be either a private property value, on which the company is entitled to a return, or a public or social value that is not considered in the measurement of reasonable earnings. When these rights are controlled and distributed by public authorities, they have a public or social value. Like franchises, they have no value for regulatory purposes. Consequently the best water rights of electric companies, the rights they receive from Congress and the Federal Power Commission, are not a part of the rate bases.

The lesser water rights usually are acquired through land purchases. Rights to subsurface water are unimportant in utility regulation. Only small water companies obtain their water supplies from wells. No attempt usually is made, furthermore, to segregate subsurface water rights from other land rights, because percolating water, like oil and gas, can be utilized by whoever sinks a well. But electric companies take a different view of water rights that they purchase as they acquire land to get access to streams and rivers. They believe that there is a separate water-right value, giving the land a higher value than it has for non-utility uses. They seek intangible property values that are results of public utility uses of the flowing waters. And the fact of circular reasoning does not deter them as they ask for special water-right valuations, or high land valuations.

Seeking water-right valuations that are higher than the costs of the lands or rights, electric companies propose several measures of this kind of intangible property. Market value of the rights is one measure, even though the market prices are based on the prospective earnings from the water rights. The circular reasoning of the market-price measure is obvious: the earnings of a company determine the value of the rights, and the value of rights, in turn, is taken into account as the reasonable earnings are fixed. And the water-right value of a hydroelectric project sometimes is computed by capitalizing the production-cost differences between hydrogeneration and steam generation of electricity. This alternative cost measure, like the market-value measure, is designed to give all economies of hydroelectric service to the private companies.

Confronting only a few cases about water-right valuations, the Supreme Court has not yet clarified the status of water rights in earnings regulation. In 1914 a California irrigation company, which was not a public utility in the ordinary sense of the term, was granted a water-right valuation by the Supreme Court.[7] Speaking for the Court, Justice Holmes apparently based the valuation on the market-value increases of water users' land—the increases in land values that were results of irrigation service. He observed that the use of water ". . . is not by the public at large, like that of the ocean for sailing, but by certain individuals for their private benefit. . . ."[8] In the Bluefield case of 1923 the Supreme Court did not object to the nominal valuation that the West Virginia Commission fixed for water rights.[9] An allowance for water rights was one of the issues in the McCardle case. When the Supreme Court decided this case in 1926, Justice Butler said that "the evidence sustains an amount in excess of ten per cent to cover water rights and going value. . . ."[10] Writing a dissenting opinion of the McCart case in 1938, Justice Black sharply criticized the evidence on water-right valuations.* But no majority opinion of the Supreme Court said anything about water-right valuations after the McCardle case was decided.

Guided by these fragments of Supreme Court reasoning, some state commissions once allowed substantial valuations of water rights. Several of them approved water-right valuations that were well above the costs of the rights.[12] Before the New York Commission was reorganized during the thirties, it approved the capitalization of hydrogeneration economies when the water rights of an electric system were valued.[13] In the mid-thirties, however, the state commissions began to scrutinize these valuations that utility companies presented. Original cost or investment cost became the preferable valuation of the rights.[14] Valued at their costs, water rights became unimportant property items in earnings regulation. Some commissions reduced the regulatory status of the rights still more: they eliminated separate valuations of them, and allowed only land valuations.[15]

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* The city's witnesses believed that the water rights of the Indianapolis Water Company were not worth more than $75,000, while company witnesses declared that the rights had a value of $1,000,000 or more. Justice Black could not believe ". . . that, even if the people of Indianapolis and the surrounding community have permitted the Water Company to use this stream for a public service, there has been a grant of a prescriptive property right which can be capitalized by the Company, in order to exact higher water rates from the very people who granted the privilege."[11]

PATENTS

Patents are intangible property, too, of utility companies. When utility companies own patents, the managers of the companies admit, of course, that patent rights are obtained from the federal government. But they do not see a patent as a public grant of privileges in the same sense as that of a franchise, certificate, or water license. A patent can be issued to either regulated or unregulated firms; the General Electric Company, instead of an electric utility firm, can hold electric equipment patents. The managers of utility companies can see that patents often are sold for far more than their research costs. Companies gain, in fact, from the sale of some patents, unless commissions allow returns on more than the research costs or acquisition prices of the patents. They can be sold to manufacturers for more than the research costs. Even if a company sells a patent and later buys equipment that is produced under the patent, the patent sale still is more advantageous to the firm than a return on the patent cost. Given a return on only the research costs, a company gets the same earnings whether it buys, leases, or develops patents.

Commissions, on the other hand, naturally prefer a cost measure instead of a market-value measure of patent rights. Considering the public interest in low-priced and efficiently performed service, commissions can argue that the companies should buy or develop any economical means of production. If a patented technique of production reduces the costs of service and affords an opportunity for price reductions, the commissions and consumers are interested in it. They do not believe that the economies of production belong exclusively to the utility firms. Nor do they wish to pay unproductive research costs, while the companies sell the best patents. To the persons who are interested in service production instead of utility-company profits, the research costs or acquisition prices seem to be equitable measures of patent valuations. And if the research costs are counted among the current costs of service production, no patent valuations are allowed.

The choice between the cost of patents and their market value is not yet settled in reasonable earnings regulation. Indeed, the question of a patent valuation seldom arises. Only one Supreme Court decision, the Pacific Gas & Electric decision of 1924,[16] contains any comment on the question. In this case the company acquired a patent from one of its engineers, and built a new type of gas manufacturing plant. The company sought both a valuation of patent rights, which was based on cost economies, and an amortization of the remaining investment in the obsolete gas plant. A lower federal court approved only a cost valuation of the patent, and did not count the amortization of the obsolete plant investment as a cost of service. The Supreme Court thought that the company was penalized for more efficient production. Remanding the case to the lower court, the Supreme Court said,

> Whether, under the peculiar circumstances here presented, the rate base should be fixed by adding . . . some fair valuation of the patent rights, or whether prompt recoupment should be allowed for the obsolescence caused by their introduction, or whether appellant should be saved from actual ultimate loss by some other feasible method, we will not undertake to determine upon the present record.[17]

Although the Court did not commit itself to any policy, it implied that either a patent valuation or amortization of the obsolete plant investment was fair. At least it did not approve a decision that allowed only a cost valuation of patents and excluded amortization charges for the old investment.

LEASEHOLDS

Sometimes natural gas companies make outright purchases of land from which they expect or hope to obtain natural gas. When a company wants an ample future or reserve supply of gas, outright purchases of land or mineral rights are expensive; large land holdings, particularly those of proved gas land, require large investments. The natural gas firms often must rely on unproved land for a future gas supply—on land where they have a chance to find gas pools, but have no certainty of their size. If a large acreage of unproved but promising gas land is held, the company is bound to find some gas pools, but it is also sure to drill some dry wells; most of the land, in fact, probably does not yield commercial quantities of gas.[18] When the production of gas is uncertain, natural gas companies do not want to make outright purchases of land. To economize production costs, therefore, they usually lease the mineral and gas rights in land. Failing thus to find gas, they have no land to manage or sell, and can negotiate some new leases.

Relying on leases rather than land purchases, natural gas companies commonly have only nominal investments or no investments at all in their gas acreages. Sometimes the only payments for leases are delay rentals that are classed as operating expenses. These rentals are paid periodically for fixed periods of time, or until royalty payments begin at the time of gas production. In other instances lump sums, either with or without subsequent delay rental payments, are paid for the leases. These lump-sum payments commonly are small, because much of the land is leased before gas or oil discoveries are certainties. The investment costs of many gas leases are so low, in fact, that the lump-sum payments can be charged to operating expenses as they are made.

After gas is discovered and is produced in commercial quantities, the market value of a leasehold increases. A company is willing to pay more for gas-producing land than for unproved land. Thus, as a utility firm proves the presence of gas or begins to produce it, the company wants a leasehold valuation that is above the original cost of the leasehold. It may ask, indeed, for a valuation of proved and developed leaseholds that is many times larger than the investment cost of the leaseholds.[19] But how can a company or commission measure the present value of leases that give rights to produce irreplaceable quantities of gas? The market prices of equally productive leaseholds are one means, of course, of measuring the present value of the recently proved or developed leaseholds. Even if the reasonableness of a market-price measure (which is an application of the Minnesota rule of land valuations*) is accepted, the measure is imperfect; comparable leaseholds cannot be found easily.

In other instances a firm can base the present leasehold value on the selling price of gas. Measuring a leasehold value, a company can multiply the quantity of recoverable gas by its wholesale price. This method involves circular reasoning: the wholesale price usually is paid by the same utility companies whose retail prices are subject to commission control. Using another method, an alternative-cost method, the companies base the valuations on the field prices of gas, or the wholesale prices of that used for nonutility purposes. In this way the natural gas prices for carbon black, natural gasoline, and other nonutility consumers are the basis of measurement of leasehold valuations. This method avoids the circular reasoning about a valuation that is based on utility prices. But such an alternative-cost measure of valuation is not convincing. That which the company can get in nonutility markets does not measure what the public utility consumers, who pay the gas exploration costs, should be charged for service.

For many years the commissions in gas-producing states, particularly in the Appalachian area, were troubled by the inflated valuations of gas leaseholds.[20] Before 1920 a few commissions apparently believed that the gas companies should be allowed increases in leasehold valuations when gas was discovered and leaseholds were developed. Seeing the differences in the selling prices of unproved and developed leaseholds, they allowed some or all of the increases in the market prices of land or leases. At this time the West Virginia Commission, for example, allowed more than the investment costs of leaseholds, because the companies were

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* In the Minnesota Rate cases the Supreme Court accepted a market-value measure for land, but rejected the use of "multipliers" of the market value that were used to account for additional hypothetical costs of land acquisition. This legal concept of land valuation is discussed briefly in Chap. 12.

"making a 'sure thing' out of a probability" and because the companies deserved a "reward . . . for . . . business acumen and foresight."[21] Other commissions were less generous. They wanted to allow returns on only the costs of leaseholds. And when they were not commanded by the courts to use some other valuation procedure, they did use a cost measure of leasehold values. During the twenties the fair-value thinking of the Supreme Court compelled commissions to consider the present leasehold values, the values that often greatly exceeded the investment costs of the leases.

After the Supreme Court decided the Dayton and Columbus cases in 1934, the commissions did not believe that they were required to allow returns on the present values of leaseholds.[22] In the Dayton case, where the leasehold value was an important fact in the measurement of reasonable earnings, the Ohio Commission scaled down the company's valuation of land and leases so that it was about 50 per cent larger than the investment cost of the land and leases. The Supreme Court, too, was convinced that the company made a speculative valuation of leaseholds. Justice Cardozo, speaking for the Court, said,

> Plainly in all this there has been no infringement on constitutional immunities unless a higher value has been made out by evidence too strong to be rejected. But . . . the evidence is lacking in that high coercive power. Court and Commission were free in their discretion to reject as unsatisfactory the conflicting opinions of a group of friendly experts.[23]

An original-cost valuation of natural gas property was accepted in the Hope case. And when another natural gas case (the Colorado-Interstate case) was decided in 1945, the Court accepted an original-cost valuation of leaseholds rather than the company's market valuation of the Texas Panhandle leaseholds.[24] It even approved a first-cost valuation for some leases.[25] About three-fifths of the total book value of the leaseholds was disregarded; five important leases, containing 47,000 acres, had an original-cost value of $4,200 or less than 10 cents an acre; and three other leases were given no rate-making value at all. Yet only Justice Jackson, who concurred in the Court opinion, objected to the nominal leasehold valuations. Observing the "high risk of wildcat speculation" relative to the low property valuation, Justice Jackson saw a "fantastic method of fixing a 'just and reasonable' price for gas."[26]

Sometimes, as in the Colorado-Interstate case, an original-cost valuation for gas leaseholds seems ridiculously low. Such a low valuation may restrict the exploration for new gas pools. An unregulated company certainly cannot be induced to do any wildcat drilling unless it gets more than a 6 or 7 per cent return on an original-cost valuation of leaseholds.

Even regulated companies may hold back drilling tests, though most of them, looking to future money-making, are not likely to neglect their gas supplies. As a defense of original-cost valuations of gas leaseholds, some facts of earnings regulation cannot be ignored. When a company leases land for future gas production, it is taking a chance that no gas will be found. But the delay rentals, which are the major leasing costs of most natural gas land, are operating expenses and are paid by the consumers. Likewise, the costs of drilling dry holes either are charged to operating expenses or are capitalized.* When a prospering company acquires leases and drills for gas, the costs are recovered from the consumers of gas service. Buyers of gas rather than the gas firms pay the developmental costs. Consequently, if natural gas companies are allowed to inflate the valuations of developed gas lands while the buyers are responsible for the expenditures that made the discoveries and inflated valuations possible, they gain at the expense of the consumers. Under these conditions the commissions and courts, trying to give the benefits of gas discoveries to the consumers, should not give returns to the companies on any more than the original costs of gas leaseholds.

GOING VALUE

Utility companies were determined to get consideration of intangible property values in earnings regulation, to get returns on something more than tangible property valuations. Failing to get a return on one kind of intangible property value, they tried to build up a case for some other value.† Unless the managers of companies could establish claims to returns on something more than tangible property values, they could not fend off price reductions and protect the established earnings; they could not protect the excessive earnings that the inept commissioners and a sluggish regulatory process never eliminated. And some firms could not support their excessive capitalizations of past and prospective returns so that bulky debts did not disturb the good fortunes and economic powers of the voting stockholders. Expert accountants, engineers, and lawyers were useful servants in the fight for earnings; they constructed and explained the case for returns on more than the "bare bones" values of public utility plants. And if some commissions thought that the intangible values were a fiction of managerial minds and refused to recognize them, the companies could appeal to the courts for more beneficial judgments. Being acquisitive business organizations, the utility companies tried to "get away with" sizable valuations of intangible property, just as they claimed returns on large reproduction-cost valuations of their tangible property.

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* When a uniform system of accounts was drawn up for natural gas companies, the Federal Power Commission classified the costs of nonproductive well drilling, losses on abandoned leases, and exploration costs for abandoned projects as current costs of service.[27]

† Speaking in the past tense in this and following paragraphs, I am thinking of the legal history of regulation, particularly the period in which the managerial claims to going values were commonly recognized by the courts. I certainly do not mean to imply that the managers of utility firms are disinterested in high property valuations today. They seem to be as anxious now to protect their earnings or to get more profits as they ever were. They may be resigned sometimes to the losses of intangible values, but they show no satisfaction with the losses. Give the companies a good legal chance to obtain some new sort of property value, and they will not be slow to present their claims and arguments.

The managerial reason for an intangible property valuation was obvious. A utility company wished such a valuation which, when added to the tangible property valuation, gave a basis for a return that was at least as high as the existing earnings. As a minimum objective, the companies wanted to escape reductions of their returns and prices. To achieve this objective, prospering utility companies needed large valuations of intangible property. Even if valuations of patent rights, water rights, and leaseholds were approved by the courts and commissions, they were not always large enough to protect the earnings of all companies. A franchise valuation, a capitalization of the prospective earnings above tangible property returns, fitted the need. But this was not sufficiently ingenious to fool anyone. It was too clearly tied up with a public grant of privileges. A better term was "good will." But it, too, was faulty, for it was associated traditionally with competitive and unregulated business. "Going value" or "going-concern value" was the term that utility companies chose for the main intangible property value. For many years going value was the most important intangible property value in earnings regulation. Approved by the Supreme Court for two decades, going value appeared in many earnings investigations even though no sensible measurement of the value ever was devised and the going value seemed to be the equivalent of a franchise or good-will value.

Most utility companies have the general characteristics of a going concern. At least they seem to have those that John R. Commons, the notable institutional economist, associates with a going concern.[28] A going concern operates successfully, and is likely to continue operations indefinitely. It has a going plant that is technically well chosen for the production of service. It has a going organization of management, experts, and laborers. And there is a going business attachment of customers to the company. A going concern is what we mean when we say that a business organization has a good financial history and a promising future. Expected to maintain a beneficial technical, managerial, and bargaining status, the company has more than a "bare bones" value, "dead plant" value, or "salvage" value. As Commons says,*

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* Quoted by permission of The Macmillan Company, publishers, from *Institutional Economics,* p. 58.

A going concern is a joint expectation of beneficial bargaining, managerial, and rationing transactions, kept together by "working rules" and by control of the changeable strategic or "limiting" factors which are expected to control the others. When the expectations cease then the concern quits going and production stops.[29]

Measurement of Going Value. An unclear legal concept, going value was measured in several ways.[30] Most of the measures were developed by the utility companies, who were the beneficiaries of any allowance for going value. These measures usually were not based directly on the real source of the value—the earnings above a reasonable return on the tangible property value. Yet the barest economic study cannot dissociate the going value of a company from its anticipated earnings. Either the prospective earnings are the real basis for a going value, or there is no going value. Measured objectively, such a value is a capitalization of the anticipated excess earnings: a reasonable return is computed for the tangible property, then this is deducted from the total prospective return of each future year, the differences are discounted at the regulatory rate of return, and the discounted value of these future earnings is the going value. It is the present value of future excess earnings and of future monopoly returns. It is the same thing as the full-franchise value or the good-will value.[31]

Even if protection of existing earnings was the purpose of a return on a going value, the companies did not dare measure going value as the present value of future excess earnings. A capitalization of excess earnings attracted criticism, and spoiled the chance for any going-value allowance. Nor did the courts approve a capitalization of excessive earnings. Such a valuation stopped any further earnings regulation. In some cases, however, the going value was measured by the "development" costs of a utility company. Since going value distinguished an operating, established firm from a new and untried company, the measure of it was the cost of acquiring a market and an efficient business organization. It was the difference between the investment cost of a developed company and that of tangible property. Using available accounting information, some companies computed the expenditures of adjusting plant facilities to efficient operation, training personnel and management, developing the existing market, and maintaining unused plant for anticipated demand increases. All firms, regulated or unregulated, incurred special development costs. Among utility companies these costs, according to rough estimates, commonly were between 10 and 20 per cent of the tangible property investments; for some companies they were, perhaps, as high as 50 per cent of the physical plant investments.[32]

Another cost measure of going value, which once was used by the Wisconsin Commission, was a capitalization of the developmental deficits of a company. If a company incurred deficits as it developed an organization, market, and efficient plant, these deficits were the measure of going value. When a firm received less than reasonable earnings in one year, the deficiency was added to the reasonable property value for the next year. This investment-cost measure of going-concern development was not used by companies and commissions. If it had been, a limitation of the developmental deficits would have been necessary. Otherwise some unsuccessful or poorly managed firms, which had incurred deficits for a long time, would have claimed high going values. Unless some maximum had been fixed for going value, inefficient companies would have had higher reasonable values of property than the efficient firms.

Sometimes the companies presented reproduction-cost measures of going values. They estimated the current costs of training managers and skilled employees, establishing amicable customer and public relations, and acquiring markets. Like a reproduction-cost valuation of tangible property, this measure of going value was speculative and unreal. No one could really say just how much a company, starting from scratch today, would spend to develop a going organization and market. There was some double counting, too, in this measure: the actual organization and market-development costs often were charged to operating expenses, and were classed as reasonable service costs in earlier operating periods. But the utility-company managers and their engineers, who were accustomed to conjectural property valuations, often went ahead with a reproduction-cost measure of the value. They did not care how they obtained a going-value allowance. But they wanted to get one—a large one.

There were several other and simpler measures of going value. One was based on the gross revenue of a utility company for one or more years, and another was a percentage of gross revenue for a decade or more. The amount of gross revenue apparently was an arbitrary choice of utility-company managers or valuation engineers. Such a measure was as close as the companies ever came to the source of going values, the earnings above the reasonable returns. Another measure, which was a current valuation of the clientele or market development, was a round price, say $15, for each customer or meter. This customer basis of going-value measurement resembled some crude measures that accountants used to compute the good-will values of unregulated businesses. But when the going value was based on the number of customers or meters, the buyers could plainly see that they were paying something for their willingness to buy service. Their demand for service was translated into a cost of service.

Many going-concern valuations were measured as percentages of the tangible property valuations. The reasonable value of all property was computed, and then the companies and commissions added 5 to 15 per cent more for the going value. Such a valuation was easy to compute. And it took the place of cost and revenue measures of the value; companies were saved speculative computations of the clientele values, or the reproduction costs of going concerns. When the Supreme Court required separate valuations for a going concern, companies often thought that 10 to 20 per cent of the reproduction-cost valuation was a reasonable sum for the value. And commissions commonly allowed 10 per cent of a tangible property value for going value.

Supreme Court Decisions. The concept of going-concern valuation was used in taxation and condemnation proceedings before it became a part of earnings regulation. Deciding a railroad case in 1894, the Supreme Court said that

> The true value of a line of railroad is something more than an aggregation of the values of separate parts of it, operated separately. It is the aggregate of those values plus that arising from a connected operation of the whole. . . .[33]

The tie-up of going-concern value with condemnation value was made clear in judicial reasoning.[34] In the National Waterworks case, which also was decided in 1894, the main issue was the price that a city should pay for the plant of a company after the franchise expired. A federal court held that the city was required to compensate the private water company not only for its physical property, but also for its customers and profits.[35] Justice Brewer, speaking for the court, said, "Such connections [customer connections] are not compulsory, but depend upon the will of the property owners, and are secured only by efforts on the part of the owners of the waterworks. . . ."[36] This concept of going value, based clearly on the condemnation analogy, was all right for property purchases, but it was not applicable to rate cases. In the Knoxville Water Company case of 1909, the Supreme Court said for the first time in utility regulation that there was an ". . . added value of the plant as a whole over the sum of the values of its component parts, which is attached to it because it is in active and successful operation and earning a return."[37] These were the beginnings of the going-value concept of property valuation.

In the Cedar Rapids and Des Moines Gas cases, which were decided in 1912 and 1915 respectively, the Supreme Court reaffirmed its opinion in the Knoxville case: a value above the tangible property value existed in public utility property. The presence of going value was observed.

Justice Day, who wrote the opinion of the Des Moines case, thought the "element of value in an assembled and established plant, doing business and earning money, over one not thus advanced" was "self-evident."[38] "This element of value is a property right," he said, "and should be considered in determining the value of the property, upon which the owner has a right to make a fair return. . . ."[39] But in the Cedar Rapids case the Court excluded an allowance for "good will or [any] advantage incident to the possession of a monopoly. . . ."[40] The Court did not require the regulators to find a separate going-value allowance. As Justice Holmes said, the regulators took "into account the fact that the plant was in successful operation." Likewise, in the Des Moines case the Court did not require a separate going-value allowance, even though the existence of the value was admitted.

When the Denver Union Water case was decided in 1918, the Supreme Court approved a separate allowance for going value.[41] And in the Galveston Electric case of 1922 the Court considered the method of going-value measurement. It rejected the Wisconsin method of going-value computation, denying the company a right to recapture past losses out of future earnings. When the Court rejected the developmental deficits as measures of going value, it said,

> Past losses obviously do not tend to prove present values. The fact that a sometime losing business becomes profitable eventually, through growth of the community or more efficient management, tends to prove merely that the adventure was not wholly misconceived. It is doubtless true . . . that a prospective purchaser of the Galveston system would be willing to pay more for it with a record of annual losses overcome, than he would if the losses had continued. But would not the property be, at least, as valuable if the past had presented a record of continuous successes?[42]

During 1923 the Court decided two cases wherein it encountered but did not comment on going-concern valuations.[43] The McCardle decision of 1926 fixed an important place for going value in earnings regulation, just as it gave real significance to a reproduction-cost valuation of tangible property. Justice Butler said that, in this case, the "evidence is more than sufficient to sustain 9.5 per cent [of fair value] for going value."[44] The McCardle opinion offered no explanation of just how the evidence sustained the going-value allowance, or just how going values were to be measured in subsequent cases. Apparently the commissions were expected, as they measured going value, to add approximately a flat ten per cent to the fair value of tangible property. At any rate, that was what most state commissions did for several years after the McCardle decision.

The McCardle decision was revised in the Los Angeles opinion of

1933. In this case the company sought a separate allowance of $9,000,000 for going value, but the California Commission did not allow the company a return on any going-concern valuation. The evidence for a going value was not convincing. Several methods of measurement were presented by the company: (1) one year of gross revenue, $15,801,208, (2) 15 per cent of reproduction cost (less depreciation) of the property, $10,638,000, (3) $25 for each customer meter, $8,886,700, and (4) the difference between an 8 per cent return on construction cost and the estimated net returns for the second to seventh years inclusive of the life of the company, $8,721,878.[45] Like the commission, the Supreme Court was not impressed by this unexplained and complex list of going values. The Court observed that "an examination of the evidence offered by the Company . . . shows it to be of a highly speculative and uncertain character."[46] And it thought that the other property valuations of the California Commission were large enough to eliminate the need for a separate going-value allowance.

A year later the Supreme Court, deciding the Dayton Power & Light case, followed the Los Angeles decision and did not require a separate allowance for going value. It rejected the company's evidence on such a value, saying,

> Going value is not something to be read into every balance sheet as a perfunctory addition. . . . We cannot in fairness say that after valuing the assets upon the basis of a plant in successful operation, there was left an element of going value to be added to the total.[47]

Again the Court preferred to measure reasonable earnings according to the "whole" value of property. This view was repeated in two later decisions,* both of which concerned the reasonable earnings and prices of stockyards.[48] The thinking about going value was altered so that jurists could see a company's claim as "excessive almost on its face"; and they could confirm the "impression of exaggeration" as they studied the available evidence.[49]

In the Natural Gas Pipeline case of 1942, which brought the Supreme Court close to a complete revision of the whole fair-value doctrine, the company asked for a going-value allowance.[50] The company's measure of going value was based on the developmental costs that were incurred during a seven-year period. This cost measure of the value included expenditures on new business as well as interest, taxes, depreciation, and maintenance expense on the unused plant of the company. The Court found no basis for the going value. During the seven-year period, a period of the "severest depression in our history," the company earned an 8 per cent return on its whole investment. Furthermore, the commission allowed the company a return on all its plant, the used as well as the unused. Refusing to count some costs of service twice, the Court could not find a basis for a separate going value.

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* In one of these cases, the St. Joseph Stock Yards case, the Court rejected a reproduction-cost measure of going value. The Court recognized that it was an imaginative measure because it depended on assumptions about future deficits, "elaborate guesswork" on property valuations, the recovery of business, and so on.

Seeking to protect their earnings, utility companies once obtained sizable returns on going-concern valuations. Now they are not allowed separate valuations for established, well-organized, prospering businesses. A summation of developmental deficits, a dollar value for each attached customer, the reproduction cost of a market and administrative organization, a percentage of the tangible property valuation—these and other measures of going value are no longer parts of reasonable-earnings regulation. Yet the largest of the intangible property values is not completely gone. A vestige of going value is left; at least the courts have not yet eliminated the discussion as well as the substance of it. Some companies obtain what can be called an "included" allowance for going value. As the Supreme Court says in the Natural Gas Pipeline decision, this value can be measured by necessary business expenditures: advertising and other costs of getting new business, expenses (taxes, interest, administrative salaries, and so on) of assembling a plant, the costs of maintaining an unused but necessary plant capacity, and other similar costs. These are costs that the commissions include in the reasonable property values or the reasonable operating expenses. If going value is associated with ordinary investment or operating costs, then there is no reason for further legal discussion of it. Basing going-concern valuations on costs, the Supreme Court upsets the old-time basis for the valuations—the excessive earnings and unreasonable prices of utility services.

Commission Decisions. Nearly all regulators are willing, of course, to follow the recent Supreme Court decisions on going value. Some of them deny going-value allowances.[51] These denials are based on the belief that the values are simply judgment figures, arbitrarily determined and unsupported by tangible and unassailable evidence. In still other decisions the commissions refuse to grant separate allowances.[52] Taking their cue from the recent Supreme Court decisions, the commissions state or imply that a single value of the whole utility plant contains an allowance for going value. An "included" allowance for going value becomes simply an excuse for no allowance at all.

An Unreasonable Value. When they asked for large amounts of going value, utility companies were not worried about the recovery of developmental deficits that they incurred many years ago. Subjected to infrequent and imperfect regulation, most companies recovered these deficits long ago. Moreover, the costs of management and market development—the costs of going-concern development—were charged to operating expenses, and were covered commonly by the revenue that consumers contributed. Because both developmental deficits and managerial or selling costs usually were paid out of revenue, utility firms did not have a cost basis for going values. But they always had an earnings basis for them. Whenever company managers faced earnings investigations, they attempted to minimize or to prevent altogether the regulatory reductions of prices and earnings. Going-concern valuations served this end. Just as reproduction-cost valuations were used to protect earnings, so going-value allowances also were a means of earnings protection.

The wants of a utility company do not make a case for a going-value allowance. And the existence of a going concern does not justify an increase in reasonable earnings. A utility company commonly has customers, a functioning management, an organized personnel, and an efficient plant. Existence of these going concerns, consisting of going plants and going business organizations, is desirable. But buyers should not pay twice for the creation of a necessary going concern; they should not pay both the operating expenses and a return on a going-concern value. After the public gives special privileges to utility companies, the public authorities and consumers expect the firms to create and to sustain going concerns. Technical and economic efficiency is an obligation of a utility firm. The company is expected to use the most economical scale and kind of plant. It is expected to serve buyers; indeed, it is obligated to serve everyone who demands service at reasonable prices. A utility company is expected, moreover, to maintain respectable public and buyer relations. And while good buyer relations, a well-developed market, competent management, and an efficiently operated plant are valuable to a utility company, the franchises and certificates allow the firm to develop a going concern. The going-concern value depends on a franchise or certificate; it is, in fact, another name for a franchise or certificate value. It is a social value, and belongs to the public instead of the private utility company.

Chapter 15

Depreciation

NEXT TO the measurement of the reasonable return, nothing is so important in public utility regulation as the measurement of plant depreciation. This is another unsettled and confused part of public utility regulation, because regulators, company managers, engineers, and accountants do not agree on the solutions of depreciation problems. Just as regulation of depreciation accounting, either for bookkeeping purposes or reasonable-earnings measurements, cannot please everyone, so a discussion of depreciation, which is carried as far as a choice of desirable regulatory policies, omits or neglects something that is stressed by one side or the other. At least the discussion in this chapter does not cover the whole history of depreciation thought, give all the accounting or engineering details of the problems, or satisfy the special interests of conflicting groups—particularly the managers and engineers. Yet, even though this chapter does not deal with everything and cannot satisfy everyone, it does present some legal, accounting, and economic reasoning about depreciation problems—about the ways in which the property depreciation and the accounting for it affect the reasonableness of utility-company earnings.

There are two main depreciation problems. One of these is computation of the annual depreciation cost—the amount to be counted among the reasonable service cost and be covered by the customer payments for service. Depreciation accounting, which determines (or allocates) the annual depreciation charges, is controlled now by nearly all commissions. This is a new power of the commissions, because the companies administered depreciation accounting or practiced retirement accounting before 1935. Now the commissions require full-reserve accounting for depreciation, and spread the depreciation cost of production (i.e., the original or investment cost of depreciating plant) throughout the operating periods in which the plant is used.

The other problem is deduction of the accumulated plant depreciation when a reasonable property valuation is determined. How much accrued depreciation, as it commonly is called, shall be deducted to determine the net property value on which a reasonable return is figured? Even if the commissions use investment-cost or original-cost valuations of property, they still deduct the accrued depreciation of the property. The past depreciation charges, which are measured by the depreciation reserve, can be chosen for the deduction. Another choice, which the utility companies like, is the "actual," physical depreciation of plant that is observed and computed by engineers. Again there is a property-valuation conflict between the companies and commissions. And while the Supreme Court has abandoned the Smyth rule of earnings regulations and has altered the regulatory significance of property valuations, it has not definitely forsaken the technical observation measure of accrued depreciation.

THE GENERAL NATURE OF DEPRECIATION CONTROL

Both physical conditions and functional or social conditions cause plant deterioration, and ultimately necessitate an abandonment or a replacement of the deteriorating plant. When a plant is in use and is subject to weathering, it deteriorates. This deterioration is not visible from moment to moment; physical deterioration of durable plants cannot be accurately measured for short-time periods or a few output units. But deterioration and retirement of plant are inevitable. Bus tires wear out; telephone and electric poles rot; the reservoirs of hydroelectric plants silt up; gas and water mains corrode.

Inadequacy, obsolescence, and public requirements of service production are the common kinds of functional or social depreciation. Inadequacy of utility plant occurs as a result of demand increases: when the demand for service increases, the existing plant cannot serve all the buyers efficiently. If the population of a market area grows rapidly or if important new uses of service develop, the old and serviceable plant is discarded and is replaced by a similar but larger plant. Obsolescence of plants is associated most commonly with technological innovations. Outmoded equipment is not discarded because it cannot produce service; rather, it is abandoned because new and more economical equipment is available to produce the same (or improved) service. Occurring frequently, technical changes make obsolescence an important part of plant depreciation. Finally, public authorities, including the commissions, sometimes order equipment changes so that the welfare of the general public, utility consumers, or company employees is improved. And when a company is ordered to make equipment changes, the old equipment obviously becomes obsolete in its present location.

Choice of a Definition. No one says that all property items have perpetual lives, that most kinds of property do not deteriorate eventually to the point of uselessness, or that property items do not come and go. The limited life of equipment is recognized by both the utility companies and the commissions. Knowing the inescapable deterioration of plants and anticipating the necessity of future plant replacements, both the companies and the commissions can emphasize the physical characteristics of the depreciation process. They can define depreciation as a technical process—as the inevitable deterioration of plant efficiency. The depreciation committee of the NARUC, which made a long and expert report on public utility depreciation in 1943,[1] says that "depreciation is the expiration or consumption, in whole or in part, of the service life, capacity, or utility of property . . ." as a consequence of wear, decay, weather, inadequacy, obsolescence, or government requirements.[2] A piece of equipment may deteriorate slowly because it is affected primarily by wear or weather; or it may suddenly become inefficient because a new kind of equipment, which makes the old equipment completely obsolete, is available. But, while the speed of the depreciation process can vary, the eventual deterioration of plant efficiency is a certainty.

The real depreciation process is an accepted technical fact; at least for long-period or anticipated production. But the companies, commissions, accountants, and engineers do not agree on the purposes of depreciation accounting—notably the annual charges to depreciation expense accounts and credits to the depreciation reserve accounts. Several definitions of depreciation are possible.[3] One group maintains that accounting should be only for the declining operating efficiency that can be measured for the existing equipment. This is a technical concept of depreciation that sometimes is used by engineers. If a plant cannot produce as much service at the end of a year as at the beginning, it depreciated during the year. If, on the contrary, the productive efficiency of the plant does not change during the year, there is no depreciation. The engineers and managers of utility firms frequently speak of the "per cent condition" of their plants. When they say that a plant has a 90 per cent condition, they mean that it is, in their judgment, 90 per cent as efficient as a completely new plant. Treating depreciation as the decline in operating efficiency, they look at the immediate condition of a plant rather than the eventual and inescapable retirement of much equipment. Their acceptance of the operating-efficiency concept is tied up, furthermore, with their preference for retirement accounting. The operating-efficiency definition and retirement accounting go together nicely. Until a piece of equipment is retired from service, these technically minded men, who have an understandable interest in full managerial control of depreciation accounting, can claim that a plant is as good as a new plant—or nearly so.

The depreciation expense of any year can be defined, too, as the anticipated replacement cost of existing plant services. Expecting to replace various parts of a plant at different future times, the managers charge the expected replacement costs to each operating period in proportion to the plant service that seems to be performed in each period. The purpose of this kind of depreciation accounting is not the recovery of past investments, but financial provision for plant replacements. Enough depreciation expense is charged to past and current operating periods so that investable funds or liquid assets are available for plant reinvestments. A depreciation fund or some other cash fund can be used with this procedure, though a special earmarking of cash is not necessary. Using this concept of depreciation, the company managers aim to maintain the capital values of their plants.* They try, as one writer says, to maintain "future earnings possibilities."[4] Even if the purpose is defensible, this definition of depreciation is rarely used by accountants. The rub is the anticipated replacement cost of a plant; no one knows today what plant replacements will really cost at some future time.

Another concept of depreciation accounting is preferred by commissions and most accountants. They use the same kind of depreciation accounting for public utility companies that is used commonly for unregulated firms. A service life is anticipated for each kind of equipment, and the cost of equipment (less salvage value) is charged off to depreciation expense during the expected-life period. The cost of equipment is considered a prepayment of a future series of anticipated services. When this concept is used, the purpose of depreciation accounting clearly is the recovery of the investment in the deteriorating plant. And the depreciation process is expected to consume the plant investment during the anticipated life of the property in which the investment is made. This is a simple and convenient method of depreciation accounting that is controlled by available facts. The company and commission use the "first" original cost or the investment cost of property, not the replacement cost; property values are obtained from accounting records rather than engineering appraisals. Actual deterioration of the plant is not measured each year; the annual depreciation cost is controlled by inescapable deterioration and abandonment of property, not the immediate loss of technical efficiency. Each annual charge for depreciation expense does not measure the actual physical deterioration of each year. Each charge is part of the whole depreciating investment that is arbitrarily allocated to a segment of the service-life period.

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* A similar purpose is the maintenance of the purchasing power, the real capital values, of plant investments. This purpose, which accountants often discuss but seldom use, involves an adjustment of depreciation expense charges to either current or anticipated changes in the price level.

Recovered Depreciation. Another term is "earned" or "recovered" depreciation. When a company incurs accounting deficits, it does not earn or recover all depreciation charges. It does not obtain enough revenue to cover all the depreciation expense as well as other current costs of service. But when it prospers, the depreciation charge simply reduces the net accounting earnings—those that are available for interest and dividend payments. This company earns or recovers the depreciation charge. The depreciation expense of a fiscal period is recovered when the total revenue of the period equals the total expenses, including the depreciation expense, of the period. This does not mean that some cash revenue is earmarked as recovered depreciation; but it does mean that the revenue, viewed retrospectively through an operating period, is large enough to cover all service costs. If a utility company obtains reasonable earnings every year, it recovers the depreciation charges that the commission approves or prescribes. The commission fixes the reasonable investor return and the reasonable depreciation cost; then prices are chosen so that the total revenue is expected to cover these. Recovered depreciation cost is a condition of reasonable-earnings regulation.

Legal Right to Depreciation Provisions. Commissions and courts recognize depreciation expense as an operating cost of utility service.[5] Although commissions and companies do not always agree on depreciation accounting methods or the measurement of reasonable depreciation costs, they customarily include some depreciation cost among the reasonable costs of a utility service. The measurement of the reasonable depreciation cost is a more recent regulatory problem than the fair return for investors. Long after the companies and commissions took reasonable-return disputes to the courts, the Supreme Court said nothing about depreciation expense as one determinant of reasonable utility prices and earnings. Depreciation cost was not mentioned in the Court's famous Smyth v. Ames decision of 1898.[6] And for several years after the Smyth decision, the Court still did not recognize this cost as a necessary determinant of reasonable earnings.[7] The Court did not refuse to consider the depreciation cost of service. Instead, neither the companies, which practiced retirement accounting, nor the commissions, which were confined chiefly to railroad regulation before 1910, brought depreciation disputes to the Supreme Court.

The right of a utility company to depreciation expense allowances was first stated by the Court in 1909. This was done in the Knoxville Water Company decision.[8] Recognizing that a water company's plant "begins to depreciate in value from the moment of its use," the Supreme Court went on to say that

> Before coming to the question of profit at all the company is entitled to earn a sufficient sum annually to provide not only current repairs, but for making good the depreciation and replacing the parts of the property when they come to the end of their life. The company is not bound to see its property gradually waste, without making provision out of earnings for its replacement.[9]

And in later cases the Court approved depreciation provisions not only for the use and weathering of property, but also for the effects of obsolescence and inadequacy.[10] Likewise, the Court required a depletion allowance for the consumption of irreplaceable natural resources. In the Columbus Gas & Fuel case, where the depletion cost of a natural gas company was disputed by the Ohio Commission, Justice Cardozo said,

> To withhold from a public utility the privilege of including a depletion allowance among its operating expenses, while confining it to a return of 6½ per cent upon the value of its wasting assets, is to take property away from it without due process of law, at least where the waste is inevitable and rapid. . . . Plainly the state must either surrender the power to limit the return or else concede to the business a compensating privilege to preserve its capital intact.[11]

Obligation of Depreciation Accounting. After the Knoxville case was decided in 1909, utility companies were expected to account fully for the depreciation of their plants. When they disregarded this depreciation, the commissions could charge the losses to the firms instead of the consumers. In the Knoxville opinion the Supreme Court said,

> It is not only the right of the company to make such a provision, but it is its duty to its bond and stockholders, and, in the case of a public service corporation . . . , its plain duty to the public. . . . If, however, a company fails to perform this plain duty and to exact sufficient returns to keep the investment unimpaired, . . . the fault is its own.[12]

Later, Justice Brandeis, writing the Court's decision in the Galveston Electric case in 1922, strongly reiterated this view.[13] Whether the failure to provide adequately for past depreciation ". . . was the result of imprudence in engaging in the enterprise, or of errors in management . . . ," Justice Brandeis concluded that the company ". . . cannot erect out of past deficits a legal basis for holding confiscatory for the future rates which would . . . otherwise be compensatory." [14]

The Knoxville and Galveston decisions do not distinguish between different reasons for deficient depreciation charges and deficient depreciation reserves. A simple legal rule is prescribed: if the companies do not make adequate charges to depreciation expense and do not accumulate the necessary depreciation reserves, they cannot increase the charges at a later time and recoup the deficiencies from the consumers. Having a managerial responsibility for proper depreciation accounting, utility firms are not allowed to recalculate depreciation costs, charge the deficiencies to future customers, and thereby prevent or limit the price reductions.

Yet there is an obvious difference between an honest error and a deliberate miscalculation in depreciation accounting. The motives of company managers are important. A firm may reduce the charges to depreciation expense so that the dividends of common stockholders can be larger. This was possible when many companies used retirement accounting (which is described in a later section), and made only nominal annual charges to retirement expense. These deficiencies can be charged to the investors; they can be taken out of the earned surplus accounts. If a large adjustment of a depreciation reserve is necessary, the depreciation committee of the NARUC even is willing to force a company through reorganization or recapitalization proceedings.[15] Other deficiencies of the depreciation accounting are unavoidable. Company managers can make mistakes as they estimate the lives of property items, because they do not know how much wear-and-tear depreciation will be experienced, how the future demand changes will affect the present adequacy of plant capacity, and what technical changes will appear to make the installed equipment completely or partially obsolete. Under these conditions the depreciation charges can be increased, and the depreciation reserves can be gradually built up.*

The Knoxville-Galveston rule is not applied strictly by state and federal commissioners. Even if the deficiencies in past depreciation charges and the current depreciation reserves are large, they usually are corrected with higher future charges to depreciation expense rather than reductions of the earned surplus accounts or financial reorganizations. The regulators commonly are tolerant and generous. Utility companies are subjected now to full-reserve accounting for depreciation (which is explained later), and are expected to make annual charges to the depreciation expense accounts. Guided by common accounting practices, commissions encourage conservative estimates of property lives and quick write-offs of plant investments. And if a piece of equipment wears out before the original cost is completely charged to depreciation expense, the commission usually does not stop the depreciation charges. It allows the company to write off the remaining value of the equipment. Even when the utility firms were ordered to make regular charges to depreciation expense and to give up retirement-expense accounting, they commonly were not penalized for past accounting deficiencies. Most commissions did not make depreciation accounting retroactive, holding all companies responsible for inadequate depreciation reserves. Instead, the depreciation accounting started from scratch, reserves were built up by charges to depreciation expense, and companies ordinarily were allowed to recover their investments from consumer revenue. Adjustments of depreciation reserves customarily come out of consumer revenue, not out of the dividends of common stockholders.*

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* The depreciation committee of the NARUC suggests another way in which deficient depreciation reserves can be adjusted: excessive earnings, accumulating because the regulators do not undertake investigations every month or year, can be "appropriated to the depreciation reserve." [16]

THE DEPRECIATION BASE

When the common definition of depreciation is used, the depreciation cost for any year is based on the cost of property that is consumed gradually in public utility service. Some property items are omitted from the cost of depreciable plant such as land, intangibles, and the overhead costs that are not associated with particular property items. Yet, even if commissions and companies can agree on the inventory of depreciable plant, they still can choose different property valuations for depreciation accounting. This takes the discussion back to the valuation controversy, back to the choice between original-cost and reproduction-cost valuations of public utility property.

Original-cost Valuations. Following common accounting practices, commissions usually choose either investment cost or "first" original cost as the property value base for depreciation accounting. When the Interstate Commerce Commission ordered railroad companies to shift to full-reserve accounting for depreciation in 1931, the investment cost of railroad property was the selected base for periodic depreciation charges.[18] The ICC followed general accounting practices, planning to account for investment consumption rather than plant replacements. Other commissions, too, required full-reserve accounting for depreciation expense after 1935. But they did not always choose an investment-cost (an ordinary original-cost) base for depreciation charges. They commonly based depreciation charges on the new book cost of property—the first original cost of depreciable property. An original-cost or investment-cost base for depreciation accounting and regulation is simple and convenient. It does not change throughout the service life of the equipment, thereby giving a stable base for periodic measurements of depreciation expense. But when the depreciation charges are based on the current replacement cost of property, new property valuations must be computed each year. And even after the current replacement costs are estimated, the companies

* Recognizing possible differences in individual cases, the depreciation committee of the NARUC did not propose a uniform rule for the adjustments of depreciation reserves. If all adjustments were charged to private investors, the committee believed that the corrections could "cause injury to security holders out of proportion to the long-range benefits."[17]

have only imaginary replacement costs; the real but yet unknown costs of plant replacements will be incurred in the future.

Although the Supreme Court usually gave commissions much discretionary control of accounting practices,[19] it did not approve an original-cost base of depreciation-cost measurement for a long time. When the Pacific Gas & Electric and United Railways cases were decided in the twenties, Justice Brandeis, who wrote dissenting opinions of the two cases, argued vigorously and cited many accountants' opinions for an original-cost base of depreciation measurements.[20] He said that the ". . . acceptance of the doctrine of Smyth v. Ames does not require that the depreciation charge be based on present value of plant."[21] And he chided his fellow jurists for inconsistent reasoning, because they approved an original-cost base of depreciation charges for income taxation.[22] But the majority of the Court was not won over by his arguments.

In the Lindheimer decision of 1934, however, the Supreme Court seemed willing to allow an original-cost basis of depreciation accounting. It observed that a depreciation charge was ". . . an allowance for consumption of capital in order to maintain the integrity of the investment in the service rendered."[23] In the Natural Gas Pipeline case in 1942 the Court went further. Using a sinking fund, the company wanted to amortize the reproduction cost of its property. But the Court, approving the findings of the commission, said,

> When the property is devoted to a business which can exist for only a limited term, any scheme of amortization which will restore the capital investment at the end of the term involves no deprivation of property. . . . The Constitution does not require that the owner who embarks in a wasting-asset business of limited life shall receive at the end more than he has put into it. . . . We refuse to make an allowance of amortization in excess of cost. To do so would not be the computation of a proper expense, but instead the allowance of additional profit over and above a fair return.[24]

But the Court refused to consider whether, under certain conditions, there was a ". . . constitutional requirement that the amortization base be the reproduction value rather than the actual cost of the property devoted to a regulated business."[25] It was enough, the Court thought, that the original cost of property ". . . will be completely restored by 1954 by the annual amortization allowances." And when Justice Douglas wrote the majority opinion of the Hope Natural Gas case in 1944, he cited the Lindheimer and Natural Gas Pipeline decisions and again said that original cost of property was an adequate basis for measurement of a reasonable depreciation cost.[26]

Reproduction Cost. The two natural gas decisions, the Natural Gas

Pipeline and Hope Natural Gas opinions, ended company claims for depreciation costs that were based on reproduction-cost valuations of property. These claims originally appeared during and after the First World War. Just as the higher prices of the war period brought out claims for a reproduction-cost valuation as a fair-return base, so did this inflation of the price level seem to justify the same property valuation base for depreciation accounting. Yet in only one case, the United Railways case of 1930, did the Supreme Court explicitly choose reproduction cost as the valuation base for depreciation expense. Justice Sutherland said,

> Manifestly, this [depreciation] allowance cannot be limited by the original cost, because, if values have advanced, the allowance is not sufficient to maintain the level of efficiency. . . . This naturally calls for expenditures equal to the cost of the worn out equipment at the time of replacement; and this, for all practical purposes, means present value.[27]

Quoting the Michigan Supreme Court, Justice Sutherland said, "If the rate base is present fair value, then the depreciation base . . . is the same thing."[28] This measure of the depreciating property value, which increased the reasonable depreciation cost as it increased the reasonable returns, was explicitly set aside in the Hope Natural Gas decision. Justice Douglas, writing the majority opinion of this case, said, "We cannot approve the . . . holding of United R. & Electric Co. v. West."[29]

When depreciation expense is measured now, the Supreme Court is on the side of most accountants and commissions. Since it approves an original-cost or investment-cost base for these charges, it also accepts the recovery of past investments as the main purpose of depreciation accounting. In public utility regulation the legal as well as the accounting concept of depreciation is consumption of the services of existing equipment. The Court, like the accountants and regulators, does not see a provision for reinvestments as the main purpose of depreciation accounting. As a company recovers the original property cost with depreciation charges, it may or may not accumulate enough cash or other liquid assets to pay replacement costs as they occur. This is a chance that the utility companies must take. Until plant replacements actually are made in the future, firms do not know whether they have enough funds to finance the replacements. And, meanwhile, the commissions are not harried by the unclear meaning of reproduction cost, expensive and detailed studies of replacement cost, and protracted litigation.

DISTRIBUTION OF DEPRECIATION COST

The actual depreciation of a large utility plant cannot be measured accurately from day to day or year to year. No one can say just how much a plant deteriorates today, this month, or this year, even though parts of the plant are certain to deteriorate sometime and are certain to be discarded eventually. Since much property of public utility systems does not last forever and is replaced sometime unless operations are discontinued, depreciation cost is experienced by all companies. Some charges for property use must be made sometime. Otherwise the utility company does not count and try to recover all costs of service. Several general methods can be used to account for property use—to assign the value of deteriorating equipment to operating expenses.

When one method of property accounting is used, the investment costs of equipment, like raw material and labor costs, are charged to operating expenses as the investments are made. Second, the investment cost of equipment can be charged to operating expenses after the equipment is retired. Third, depreciation charges can be made now and then so that the investment cost (or some other property value) of equipment is recovered sometime. Finally, periodic depreciation charges, which are preferred by commissions, are made throughout the estimated service life of depreciable equipment. After the service life of a property item is estimated, any one of several formulas is used to spread the depreciating property value, which usually is the original cost of property less salvage value, over the service-life period. A series of periodic depreciation charges does not precisely measure the actual depreciation of each period. Yet the commissions prefer to translate a depreciating property value into current depreciation costs rather than to rely on the uncertain, managerial manipulation of depreciation expenses or plant retirement charges.

Retirement Methods. When reasonable earnings for a year are computed, the utility companies expect an allowance for depreciation cost. The deterioration and inescapable abandonment of equipment must be translated, they believe, into a reasonable service cost. But they have a different view of depreciation accounting. Many of them want to use retirement or retirement-expense accounting.* If the retirement method is used, the cost of equipment is withdrawn from plant accounts when the equipment is retired, and is charged to retirement expense. Then the investment cost of the replacement is charged to a plant account. Equipment depreciation is not accounted for until the equipment is retired. Retirement-expense accounting is similar to retirement accounting. Modifying the retirement method, the companies make some annual charges to retirement expense. They build up nominal retirement reserves (the equivalent of depreciation reserves) so that retirement costs can be equalized from year to year. But the retirement reserves are only as large as the companies make them.

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* Another method, which resembles retirement-expense accounting, is called the "renewal method." When a property item is replaced, the cost of the replacement is charged to operating expense. Reinvestments in equipment are treated as if they are plant repairs or plant maintenance expenses. Before the Interstate Commerce Commission required full-reserve accounting for depreciation, railroad companies accounted for rolling-stock replacements with the renewal method.

Defending the retirement-accounting methods, utility-company engineers and managers believe that plant depreciation does not occur until the physical efficiency of the plant begins to decline. And they believe, too, that repairs, plant maintenance, and equipment replacements here and there can keep up the operating efficiency of a plant. Properly managed, a plant can be maintained so that the production efficiency does not change. But this emphasis on service efficiency is deceptive. Perhaps a piece of equipment can perform as much service today as tomorrow, this year as last year. Yet such reasoning disregards the fact that plant depreciation is inevitable, that some equipment must be discarded sometime. It is not based on a whole-life view of depreciable property.

Utility-company engineers and managers do not say that no equipment is discarded. Rather, they say that the plant replacements are sufficiently regular to maintain the operating efficiency of the plant. And after plant expansion stops and the plant becomes "seasoned," the plant reinvestments are expected to be nearly uniform from year to year. Utility plants mature. After they cease to expand, companies increase plant replacements. But the idea of regular plant replacements is a fiction that the company managers want to believe. Regular reinvestments in equipment are an imaginary condition, because companies consider prospective demand and cost conditions as well as equipment deterioration and obsolescence before they make plant replacements.

Retirement accounting is financially advantageous to the managers of utility companies. Treated as residual costs of service, plant retirements and retirement expenses can be manipulated so that the financial condition of a company seems right to both the investors and consumers. When the difference between current revenue and current expense is large, the firm can retire more equipment, increase retirement expense, and reduce net earnings. When the difference is small, the company can withhold plant retirements, pare down retirement expense, and show a good net-earnings record. Varying retirements and retirement expenses according to realized earnings, a system can stabilize its net earnings. A stable earnings record saves the companies from some regulatory action, because the commissions do not see extraordinary earnings for a few years and try to eliminate them. And stable earnings give the managers some opportunities to stabilize the payment of common-stock dividends. Indeed, a company not only can pay common-stock dividends regularly, but also can pay them from the equities of other security holders. Owners of senior securities lose their equities if a company does not make charges for depreciation or retirement cost but does use all available revenue above actual expenditures for dividend payments. Paying common dividends regularly, some firms can use up the cash and other liquid assets that should be used for either reinvestments or bond and note redemptions. They use up the assets that, in the event of depreciation accounting, are accumulated as depreciation charges are earned—that represent the recovery of depreciating investment values.

Full-reserve Accounting.[30] When the important accounting revisions were made during the thirties, state and federal commissions ordered a shift from retirement-expense accounting to a service-life and full-reserve method of depreciation accounting.[31] In this method the service life of depreciable property is estimated, then the first original cost or the investment cost of property, less salvage value, is computed. This net cost of property is divided into a series of depreciation charges, and these are spread over the estimated service life of the property. When a simple and arbitrary allocation method is used, the net cost is divided by the years of probable property life; the result is the annual depreciation charge. During each year or shorter accounting period a charge is made to depreciation expense, and another account, the depreciation reserve, is credited with a like amount.

Adequate depreciation accounting depends on the service-life estimates for various property items. Criticizing the full-reserve accounting for depreciation, utility companies say, in fact, that only a limited amount of information is available about the service lives of property items.[32] A service-life figure is admittedly an estimate, not being computed for a whole utility plant; instead, the service lives of different plant parts are estimated separately. For large property units, such as electric generating stations, a separate service life is chosen for each unit. But for small and identical property units, such as poles or mains, the service lives are computed for groups of property units.

Service-life estimates are based on the experiences that companies have with similar or identical equipment; statistical methods can be used to translate the past property retirements into current estimates of future retirements.[33] Or the service-life predictions for some new equipment are based on information from manufacturers. Even though commissions and companies carefully study the deterioration of property items, the service-life figures are guesses. The depreciation effects of use and weather sometimes can be quite accurately predicted. But obsolescence and inadequacy are roughly measured; past obsolescence and inadequacy are not always reliable measures of future obsolescence and inadequacy. Recognizing the uncertainties of future operating conditions and technological changes, commissions and companies often make low, conservative estimates of the service lives of property items.

Next, the net property value must be allocated to the operating periods in which the depreciating property is used. Several allocation methods are available. The straight-line method is recommended by the National Association of Railroad and Utilities Commissioners, is used by commissions, and is preferred by accountants. When the straight-line method is used, the net value of the depreciating property is divided by the estimated service life; the result is the periodic depreciation charge. Until the estimated period of service life expires, the same depreciation charge is made in each accounting or operating period. The straight-line procedure is simple. And as long as the service life of durable property is an uncertainty, this simple method accounts for depreciation cost as effectively as any other method. Using the straight-line method, a commission has a convenient and conservative way to distribute the cost of depreciating property to operating periods before the inevitable day of property retirement arrives.

Another method of depreciation accounting, which is used infrequently by utility companies and commissions, is the sinking-fund method.* Like the straight-line procedure, the sinking-fund method treats depreciation as a service cost, distributes depreciation-expense charges over the estimated period of service life, and is designed to accumulate a depreciation reserve that is equal to the depreciating property value. Both methods use the same property value and service-life figures. But the sinking-fund method, unlike the straight-line method, figures interest on the accumulating depreciation charges; for this reason the annual charges to depreciation expense are smaller with the sinking-fund method than with the straight-line method. Although compound interest is figured on the depreciation charges, this procedure does not involve accumulation of a real sinking fund.† The depreciation reserve grows, instead, in the same way that a sinking fund accumulates.

Depletion Charges. The depletion charges of natural gas companies usually are not determined in a straight-line manner, though an analogous method is used. These charges commonly are measured by gas production, because gas land, gas leases, and gas field equipment are useless (except for salvage values) as soon as a gas pool is exhausted. Consequently the gas field investments, including gas well and pipe-line investments as well as the cost of land and leases, are prorated among operating periods according to gas pool production. Even when natural gas firms compute depreciation charges for equipment outside the gas fields, gas production may be used to determine the annual charges.[34] But the total content of gas pools cannot be determined accurately.* And the total gas production for a single company is uncertain when several producers obtain gas from a single pool. To measure his own depletion and depreciation charges, each producer must consider the gas production practices of other producers who obtain gas from jointly used pools. As Justice Cardozo says in the Dayton Light & Power case, a measure of gas field depletion can be the "wildest sort of guess." [35]

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* A further method, which commonly is described in accounting texts, is the annuity method. This method is not discussed here because utility companies never use it.

† The procedure implies that the company not only recovers the depreciation charges and thereby acquires assets, but also receives regularly a return on these assets. Such a return is not a certainty. At least the firm is not sure to get the rate of interest that is assumed in the sinking-fund equation.

THE DEDUCTION FOR ACCRUED DEPRECIATION [36]

The depreciation of public utility property is a factor, too, when a reasonable return is measured. A return is not allowed, for instance, on the whole original cost or investment cost of property; depreciation is deducted from the property value, and a return is allowed on a net property value. This deduction is called "accrued depreciation." Just as companies and commissions do not agree about property valuations and depreciation accounting, so they differ as to the measurement of accrued depreciation. It is commonly believed that the depreciation reserves measure the accrued depreciation. For a prospering company this reserve measures the recovered depreciation charges; it measures the amount of plant investment that is retrieved out of customer revenue. But the utility companies want to ignore both the past depreciation charges and the financial effects of depreciation accounting. They believe that the accrued depreciation is the physical deterioration of plant, and can be measured by expert engineers. Accrued depreciation, they believe, is deferred maintenance.

Early Judicial Views. When the accrued depreciation was computed before the forties, the Supreme Court usually was on the side of the utility companies. The Court approved "observed" depreciation, and rejected depreciation reserves.† Recovered depreciation, like any other revenue, was considered the property of the company. This point was clearly made in the New York Telephone decision of 1926. The New

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* The rock-pressure method often is used to measure the content of a gas pool. When gas is extracted from a pool, the gas pressure decreases. Measuring the gas production for each per-pound change in gas pressure, engineers can estimate the total gas content of each pool and find a denominator for the annual depletion charges.

† Yet in the Cumberland Telephone case of 1909 the Supreme Court said, "It was obligatory upon the complainant [the company] to show that no part of the money raised to pay for depreciation was added to capital, upon which a return was to be made to stockholders in the way of dividends for the future." [37]

York Commission sought to recapture a $4,750,000 excess in the depreciation reserve and to use the excess to reduce rates. Admitting the excessiveness of the reserve, the Supreme Court said,

> The revenue paid by the customers for service belongs to the company. The amount, if any, remaining after paying taxes and operating expenses, including the expense of depreciation, is the company's compensation for use of its property. . . . Customers pay for service, not for the property used to render it. Their payments are not contributions to depreciation . . . or to capital of the company.[38]

And in the Smith case of 1930, a case involving another Bell telephone company, the Court expressed the same view. The Court said ". . . that the property represented by the credit balance in the reserve for depreciation cannot be used to support the imposition of a confiscatory rate. . . ."[39] The implication of these decisions was clear: the depreciation reserve could not be the measure of accrued depreciation. Since consumers' contributions, represented by the recovered depreciation charges, were the property of utility companies, then the depreciation reserve had no place in reasonable-earnings regulation.

When a reasonable property value was determined, the Supreme Court approved a deduction for accrued depreciation. It approved a deduction of observed depreciation—the accrued depreciation that technical experts could see. When the Pacific Gas & Electric case was decided in 1924, the Court said, "Facts shown by reliable evidence were preferable to averages based upon assumed probabilities."[40] Later, in the McCardle decision of 1927, the Court again approved the observed depreciation, saying that

> The testimony of competent valuation engineers who examined the property and made estimates in respect of its condition is to be preferred to mere calculations based on averages and assumed probabilities.[41]

An engineer's measure of accrued depreciation was preferred by the Supreme Court to that of an accountant.

The Case for Observed Depreciation. Defending the engineering observations of accrued depreciation, the company managers ignore the financial conditions of depreciation accounting. These managers and their engineers, indeed, do not accept the principle of full-reserve accounting for depreciation; they do not approve periodic depreciation expense charges during the estimated service life of depreciating property. Depreciation, they insist, is deferred maintenance. It is the loss of plant efficiency that can be seen by technical men. And accrued depreciation, measured in dollars, is the cost that will be incurred to restore the full operating efficiency of the plant. Valuation engineers commonly measure the "per cent condition" of old equipment relative to new equipment. These engineers often compute a high per cent condition; they see small amounts of deferred maintenance and accrued depreciation. A per cent condition of 80 or 90 per cent frequently is estimated, even if the plants are not expanding and the equipment is quite old. Consequently, even when companies practice depreciation accounting for many years, the observed depreciation or deferred maintenance usually is thought to be much smaller than the depreciation reserve.

A deferred-maintenance measure of accrued depreciation is related to retirement accounting. Even though depreciation accounting is substituted for retirement accounting, the utility companies still want to measure the physical deterioration of plant as property valuations are computed. If retirement accounting is practiced, a gradual process of plant deterioration is not recognized. Plant deterioration is not accounted for until equipment is retired—until the deterioration is complete. Similarly, when engineers measure the per cent condition of utility plants, they study the current physical conditions rather than the remaining service life of the plants. If a plant can produce as much service this year as last year, the operating efficiency of the plant does not change and the accrued depreciation does not increase. As long as a piece of equipment is used, engineers usually see a high physical-condition rating for it; yet the equipment may be retired in a few years.[42]

The deduction of observed physical depreciation rather than depreciation reserves is supported by the idea of permanent utility plants. An idea of plant immortality is defended not only by utility-company managers and engineers, but also by some engineers and economists who are not employed by utility companies.[43] According to this idea, there is no real need for annual depreciation charges and reserves. Expressed in an extreme form, the plant-immortality concept is based on the belief that no depreciation occurs in an operating plant. The plant is viewed as a whole. Individual parts of the plant wear out, are destroyed by weather, or become obsolete. These must be replaced. But the whole plant continues to function as though retirements of the plant parts never occur; and output never stops or slows down. The plant, therefore, is said to be immortal. When a less extreme form of the concept is used, deferred maintenance is recognized. And the total deferred maintenance is deducted from the property value on which a fair return is figured. As James Allison, the engineer, and Allyn Young, the economist, presented the permanent-plant idea, accrued depreciation could be deducted only from the investment cost of property. Reproduction-cost valuations were unrelated to the idea, because an immortal plant could not be a replace-able plant too. But utility-company engineers and lawyers twisted the idea, and deducted deferred maintenance from reproduction-cost valuations.

The Depreciation Reserve Deduction. When a reasonable property value is measured, there are sensible reasons for a deduction of depreciation reserves. To justify such a measure of accrued depreciation, courts and commissions must consider the financial effects of depreciation accounting. This is the main point: a depreciation charge is a financial transaction between the consumers and the utility company.[44] Depreciation accounting is a way to amortize the investments in deteriorating equipment. This amortization takes place when the company revenue covers operating expenses and depreciation charges—when these charges are recovered. Since the consumers contribute revenue for the investment amortization, the recovered depreciation should be deducted from the property valuation on which the reasonable return is computed. Otherwise the consumers pay returns on property values that are already amortized. These charges are rightly deducted from either an investment-cost, first-original-cost, or reproduction-cost valuation of property. The important fact is a cash contribution of the consumers, not the method of property valuation. The important fact is recovery of the depreciation charges, not physical deterioration of the plant.

Deducting the depreciation reserves, the commissions simplify the administration of earnings regulation. Deducting amounts for observed depreciation, they must examine physical equipment, guess at the actual deterioration, and delay regulatory decisions every time the earnings are investigated. The difficulties and impracticalities of observed depreciation measurements are good arguments for the deductions of the depreciation reserves. Engineers do not have the facts with which they can make refined and perfect measurements of observed depreciation. The calculation of obsolescence and inadequacy is the most difficult part of the problem. Even if an attempt is made to include all obsolescence and inadequacy in the measurements of accrued depreciation, engineers cannot make accurate computations of the partial inadequacy and obsolescence. They do not know just how demand changes and more efficient methods of production affect the existing property values. Similarly, the wear and weathering of equipment cannot be measured precisely, unless the equipment is taken apart and examined carefully. As one experienced regulator says, "There is no man living who can tell the condition of a generating instrumentality from looking at it."[45]

When deductions of observed depreciation are necessary, the effectiveness of earnings regulation is limited. Investigations are delayed while company engineers examine the property for observable deterioration.

Unless the commission accepts the company measures of deferred maintenance,[46] it must make measurements, too, of observed depreciation. If both the commission and private firm make depreciation studies, more time is taken to settle the differences between the studies. The measurement of observed depreciation, based on engineering judgments of plant condition, starts more litigation about earnings regulation. Even though the companies cannot completely stop earnings and price reductions, they can delay the reductions with controversies about accrued depreciation. If observed depreciation must be deducted, indeed, from a whole property value before a reasonable property value is computed, then the method of earnings control clearly interferes with the regulatory purpose.

Sometimes the whole depreciation reserve should not be deducted. When the company does not recover all the depreciation charges, the commission should deduct only the recovered depreciation charges, since cash contributions of consumers and amortizations of investments are the main reasons for the reserve deductions. Some utility firms, such as street railway companies, cannot obtain all the earnings that the commissions allow. These companies do not earn all their depreciation charges, because buyer demands are too low or production costs are too high; the revenues do not cover the operating expenses as well as the reasonable returns and depreciation charges. In these cases only the recovered charges for depreciation are deducted when a reasonable property value is determined.*

Deduction of the depreciation reserve should not deprive a firm of reasonable earnings. Such a deduction can reduce the allowable return of a utility company.[48] If the depreciation reserve increases more than the investments in plant additions and plant replacements and if the rate of return does not change, the return on a fixed property valuation obviously decreases. Additions to the recovered depreciation exceed additional investments in the plant. A firm can use the extra funds to retire bonds and notes, or to make investments in government and private securities. But the liquidation of outstanding debts is not always easy to arrange. And when the company invests in government or corporation bonds, it obtains a 2 to 4 per cent rather than a 5 to 7 per cent return in public utility operations.† Considering the earnings effects of depreciation-reserve deductions, a commission must not reduce the reasonable return just because the net property value of a firm decreases. If the company needs the recovered depreciation funds for future reinvestments, the regulators should not reduce the earnings that are available for dividend payments. The important fact is a reasonable return and the need for reinvestment funds, not the accounting procedure of property valuation. Unless the commissions remember the paramount importance of reasonable earnings as they deduct depreciation reserves, they can drive investors away from public utility enterprises.

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* If the sinking-fund method of depreciation accounting is used, the whole depreciation reserve should not be deducted under certain conditions. It is not deducted when the depreciation-expense charges do not include the interest on "retained" or reserved assets, and when the income from the assets is credited to the depreciation reserve.[47] Only the charges to depreciation expense should be deducted under these conditions; they are the "cash" contributions of the consumers.

† Seeing a great difference between these rates of return, one executive suggests that the deduction of a depreciation reserve may encourage utility companies to make premature abandonments of equipment and to invest in unnecessary plant capacity.[49] For the present

New Legal Views. Contrasted with depreciation deductions, observed depreciation deductions favor the utility firms. The depreciation reserve, which sums up the past contributions of consumers, can be several times as large as a company's measure of observed depreciation. The Supreme Court grants some relief from this condition. In the Lindheimer case of 1934, where a Bell company had a depreciation reserve of $48,362,000 but claimed only $15,828,000 for observed depreciation, the Supreme Court said that

> . . . it appears that the depreciation reserve to a large extent represents provision for capital additions, over and above the amount required to cover capital consumption. This excess in the balance of the reserve account has been built up by excessive annual allowances for depreciation charged to operating expenses.[50]

To compensate for an excessive depreciation reserve, the Court proposed reductions in the future depreciation charges. When the depreciation reserve exceeded the claims for observed depreciation, commissions could order reductions in future depreciation charges. But in the Lindheimer decision the Court did not say that the depreciation reserve was a proper measure of accrued depreciation.

Nor did the Supreme Court explicitly approve depreciation-reserve deductions in the Natural Gas Pipeline and Hope Natural Gas decisions. In these decisions the Court dealt with and changed the standard of property valuation; but it did not deal directly with an equally disturbing problem, the deduction for accrued depreciation. Accrued depreciation was not a regulatory issue in the Natural Gas Pipeline case. The Illinois Commission did not deduct anything for accrued depreciation, because the company used a sinking-fund method of depreciation accounting.[51] But the accrued depreciation was an important question in the Hope case. Here the Federal Power Commission openly rejected a per cent condition deduction for depreciation. The Power Commission said,

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this idea has no factual support; and I cannot imagine the conservative investors and managers of utility companies feeling so rash or so purely cussed toward commissions that they are willing to make premature abandonments.

> The fallacy of the "per cent condition" theory of accrued depreciation is plain here. To illustrate, under the hypothesis of the company's witness, . . . the property would be found to have depreciated only 25 per cent throughout its life . . . , and then suffer a precipitous loss in the brief final stage of service. Such a theory is opposed by reason and facts.[52]

Since the depreciation reserve seemed to be excessive, the commission deducted the "reserve requirement" from the original cost of company property. The Court was interested in the whole effect of the commission decision, and said nothing about the accrued depreciation deduction. Renouncing attention to regulatory methods in the Hope decision, the Supreme Court implies acceptance of any depreciation deduction but it does not approve explicitly the deduction of a depreciation reserve.

The Reserve Requirement. A choice between the observed depreciation and the depreciation reserve is the basic problem of accrued depreciation measurements. But it is not the only problem. When reasonable property values are determined, all commissions are not satisfied to deduct the existing depreciation reserves. Some regulators want to deduct what are called the "reserve requirements." These are connected with the adjustments of depreciation reserves that are discussed in an earlier section. To compute the reserve requirement of a company, a commission estimates the probable lives of property items, and calculates the depreciation reserves that the firm should have with full-reserve accounting. A company may have either a deficient or an excessive depreciation reserve. Making conservative estimates of future obsolescence and fixing high annual rates of depreciation, some utility systems have excessive depreciation reserves today. Other companies, choosing low annual rates of depreciation or having long histories of retirement accounting, have inadequate depreciation reserves; they have less than the reserves that can be calculated with full-reserve, age-life accounting for depreciation.

Whenever the Federal Power Commission encounters either deficient or excessive reserves for depreciation, it wishes to measure the accrued depreciation with the required reserves. If the present reserve is too small, the reserve requirement can be used to get larger price reductions for the consumers. If it is too large relative to the probable service life of property, the reserve requirement straightens out the relationship between earnings regulation and service-life accounting for depreciation.* Being an aggressive, rule-minded regulator, the Power Commission uses the reserve requirement more frequently than is done by other commissions. And the depreciation committee of the NARUC also recommends some adjustments of depreciation reserves, and some deductions of required depreciation reserves as reasonable property values are determined.[55] Believing that the depreciation process is primarily a function of time, the committee says that the "reserve requirement and accrued depreciation are essentially the same thing."[56] When a company ignores depreciation expenses so that dividends can be higher or when the full depreciation cost always is counted among the reasonable costs of service, the committee is certain that the required reserve should be the measure of accrued depreciation.[57] But the committee is unwilling to deduct the required reserve in all cases. If companies have only moderate deficiencies in their depreciation reserves, then the actual reserves apparently are accepted as satisfactory measures of accrued depreciation. Although the status of depreciation reserves is not clearly expressed, the committee, trying to be fair, apparently is willing to adjust depreciation reserves gradually as future charges are made to depreciation expense.[58]

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* When the Federal Power Commission decided the Hope Natural Gas case, it found an excessive depreciation reserve.[53] The actual reserve, including an earlier transfer from the reserve to earned surplus, was $46,000,000. But the required reserve, which the commission computed with service-life estimates and a straight-line accumulation, was $23,000,000. If the commission had deducted the actual reserve instead of the required reserve, the company would have received a return on only $10,000,000 worth of property.[54]

Deficient depreciation reserves are more common than excessive depreciation reserves. Deficient reserves for depreciation are predominant because most utility firms, except for the Bell telephone companies, have long histories of retirement and retirement-expense accounting. Before 1935 the companies did not estimate the service lives of property items, spread periodic depreciation charges over the service-life periods, and try to accumulate depreciation reserves that were equal to the depreciating property values. When the commissions ordered the changes from retirement accounting to depreciation accounting, many companies naturally did not have adequate depreciation reserves. The Federal Power Commission disregards past accounting practices and deducts the required reserves from original-cost valuations of property.[55] Even though the Power Commission was not authorized to control the accounting of electric companies before 1935, it uses the required reserve as a measure of accrued depreciation. State commissions usually are more lenient.[60] They are willing to build up depreciating reserves with regular charges to depreciation expense.[61] Using full-reserve accounting for depreciation, they give the utility firms more chances to accumulate adequate depreciation reserves. State commissions are not anxiously looking for every possible way in which the property values and the earnings of utility companies can be reduced.

Deduction of the required depreciation reserve, a new problem of depreciation accounting, can be defended under some conditions. Wanting more earned surplus for dividend payments, a company may take a long view of property lives and make only nominal annual charges to depreciation expense. Such a firm may not anticipate any future technical innovations that can make the present equipment completely or partially obsolete. Or a company may disregard commission orders for depreciation accounting. In these situations the required reserve rather than the actual reserve is a proper measure of accrued depreciation. Another reason for a reserve-requirement deduction can be found in earnings regulation. Some commissions counted the full depreciation costs as the reasonable earnings were prescribed. The consumers paid the allowances for depreciation costs, even if the companies did not make equivalent charges to depreciation expense. Unless the required reserve is deducted to determine the reasonable property value, the consumers must pay twice for the use of the same plant.

But deductions of reserve requirements cannot be rationally defended in all situations. Deducting the required depreciation reserves instead of the actual depreciation reserves, commissions can practice retroactive regulation. When the Federal Power Commission determines the depreciation reserve and accrued depreciation for a company, it goes behind the time when federal regulation of earnings and accounting began. Retirement accounting or haphazard depreciation accounting was practiced before 1935. These practices clearly were outside federal utility regulation. When the Federal Power Commission objects to the small existing reserves and computes required reserves, it is studying and correcting the preregulatory conditions of accounting. And the companies are penalized after they cannot alter the past depreciation accounting. When state commissions deduct for depreciation large required reserves instead of small actual reserves they, too, are practicing retroactive regulation. But the case is somewhat different from that of Power Commission regulation, because most state commissions were authorized to regulate depreciation accounting before 1935. Even so, the utility companies were allowed to use retirement-expense accounting. Some of the original uniform systems of accounts, in fact, allowed companies to choose the accounting methods for fixed depreciating assets. Commissions condoned retirement accounting. Consequently the commissions, like the companies, were responsible for deficient depreciation reserves.[62] And when their own rules of accounting were changed after 1935, the firms could not go back to early accounting periods; the companies could not change the history of depreciation accounting. If they made depreciation accounting retroactive, the commissions were not following rules of fair play.

When the reserve requirement instead of the actual reserve is the measure of accrued depreciation, commissions forget a leading argument for depreciation-reserve deductions. To justify deductions of depreciation reserves from property values, commissions usually say that the reserves measure the total amortization of property investments. A depreciation reserve represents consumer contributions (assuming the recovery of depreciation charges) that can be used to redeem bonds, or to make plant reinvestments. But a required reserve for depreciation does not measure the amount the consumers did pay for the use of property; it measures what they should have paid. The idea of a required reserve can be explained with a service-life method of depreciation accounting; it is based on the mechanics of depreciation accounting, not the financial effects of the accounting. Deducting the required depreciation reserve, commissions disregard the financial facts of recovered depreciation; they abandon the best argument for the deduction of any depreciation reserve.

There is a third argument against the required-reserve deductions. If a company has a deficient depreciation reserve and a required depreciation reserve is deducted from the property value, the financial condition and future investment decisions can be seriously affected. Cutting down the reasonable earnings with required-reserve deductions, commissions allow less returns for the existing security holders. These earnings reductions can impair the financial status of the firm. Recognizing these possible financial effects, the depreciation committee of the NARUC is willing to accept some deficiencies in the depreciation reserves.[63] Just as accounting for depreciation can affect the present financial status of utility companies, so it can also affect the future rate of investments. Denied an opportunity to recover all past investments out of future revenue, companies may take more conservative views of future earnings. Retroactive regulation of depreciation accounting can affect the investment risks. If it does, consumers get less service expansion, fewer innovations in service production, and even fewer price reductions in the future.

Chapter 16

The Special Problem of Obsolescence

PUBLIC UTILITY companies, like unregulated companies, have found from time to time that their equipment or even their type of service has been outmoded.[1] Installing more economical boilers, stokers, turbines, generators, and other equipment, electric companies frequently reduced their costs. These reductions led to the abandonment of many small plants, created the central station, and justified the superpower systems with their interconnecting transmission lines. Motor buses replaced streetcars; or one-man streetcars displaced more costly, heavier cars. At the same time the private automobile displaced parts of the urban transportation systems in the large cities, and in many small ones eliminated street railway and bus systems altogether. Dial telephone systems were substituted for manual switchboards in numerous cities. Many remarkable technical changes occurred, too, in long-distance telephone service; the coaxial cable, which can carry simultaneously a number of Morse messages, personal calls, and broadcasting programs, was one recent innovation. And the recent technological changes in the construction of gas pipe lines—seamless steel pipe, improved means of laying the pipe, and better means of gas compression—greatly invigorated the once moribund natural gas industry and led to abandonment of much gas-manufacturing equipment.

Technical innovations have been the most significant historical changes in utility industries, giving the industries their starts and lifting them to important places in the industrial and business universe.[2] In every decade there have been numerous technical improvements of the production of utility services that have justified abandonment of the old equipment before it has been worn out, and that have carried the companies closer to their maturities. These innovations, which have provided more efficient means of production, have shortened the lives of many property items. They have been important factors in depreciation accounting; company managers and commissions have tried to anticipate technical changes and plant obsolescence as they have estimated property lives and have administered depreciation accounting. But the regulatory work can extend beyond the ordinary accounting problems; it can be extended to encouragement of investments in the new equipment. Giving a broad scope to earnings regulation, a commission wants to induce investments in the most efficient equipment—to bring about abandonments of obsolete equipment. Attraction of these investments is related, indeed, to depreciation accounting as well as the general investment conditions that are discussed in the next chapter. Much of this chapter concerns the ways in which the reasonable depreciation costs of earnings regulation are related to investments in technological improvements.

THE NATURE OF OBSOLESCENCE

The fact of functional depreciation, notably obsolescence or supersession, as it is sometimes called, raises regulatory problems that are related to plant efficiency, growth of the company, and rate reductions for buyers. A special regulatory problem involves an allowance for obsolescence cost so that investments in recent improvements are not put off. It is a problem that clearly calls for a tie-up between earnings control and investments in new equipment.

Origins of Obsolescence. Depreciation is defined in the previous chapter as the consumption of an investment for any reason. That is the general concept of depreciation in utility regulation. It is the concept of most accountants who make the recovery of the past investments the main purpose of depreciation accounting. When depreciation charges to operating expenses are made periodically, no distinction is usually made between the causes of property depreciation; separate depreciation charges are not made for the different kinds of depreciation. After the service life of a property item is estimated and the depreciating investment value (commonly the first original cost or investment cost less the salvage value of the depreciating property) is determined, the customary accounting for depreciation does not require any further attention to separate causes of actual depreciation. The composite effect of various kinds of depreciation is expressed in a single estimate of the probable property life; and each depreciation charge is, likewise, a composite sum of the different kinds of estimated investment losses. The identity of separate depreciation causes is lost in depreciation accounting. No one can tell how much the utility companies charge annually for use (wear and tear) depreciation, weathering, inadequacy, or obsolescence of their plants.

Depreciation accounting obscures the identity of any periodic obsolescence cost. But it does not hide the fact that obsolescence of property is not the same thing as wear-and-tear depreciation of property. When the property depreciates as a consequence of use, the consumption of an investment and utilization of the property's services is evident even if it cannot be measured exactly. This kind of depreciation obviously is a function of current output. It occurs when products are produced and does not occur when the plant is idle. Obsolescence is a different kind of depreciation. It is not a function of the immediate output. But it can be classified as a function of the continuing service production—as a cost that must be covered sometime if the investors' revenue expectations are satisfied and production is continued. Obsolescence depreciation is a cost of production quite as much as "use" depreciation, but the origins of obsolescence are not the same as those of other kinds of depreciation.

What, then, is the origin of obsolescence and what is the peculiar nature of obsolescence cost? The principal causes are technological changes of production, and decreases in the demand for the service of a company. After a company acquires a plant and the investment is sunk, an innovation in production appears or buyers want less of the company's service at current prices. If the company were building its plant over again, it would make use of the innovation. And if the demand for service were lower, the company would not build so much plant again. Obsolescence is the decline in plant investment value because a more economical way of production is available, because more efficient and more profitable investments can be made. When a new technique of production can reduce the production costs or improve the quality of service, the investment in the old equipment is less valuable. That is true even if the company does not incur a reduction of earnings as soon as the technical change appears. When permanent or long-period changes occur in the consumer demand, the obsolescence is more evident. Experiencing demand decreases, a company knows that it has unnecessary plant capacity, that a smaller plant can produce the same service more cheaply.

Traced historically, obsolescence of utility plants was caused most commonly by technical changes. Almost before the paint and shine disappeared from much machinery, a new and more economical kind of equipment was developed. After electric railways came into common use, a rapid succession of improvements constantly changed the technical character of the street railway industry. A long line of technical changes, particularly before the First World War, left obsolescence marks on manufactured gas equipment, just as the new techniques of natural gas transmission made the gas-manufacturing plants, as well as the old gas transmission lines, partially or completely obsolete. In the telephone industry, where AT&T controlled innovations through the research work of the Bell Telephone Laboratories, great technical changes were made in the twentieth century. But the most spectacular innovations in public utility service apparently were in the electric industry—the development of gigantic generation stations, new means of electricity transmission, and superpower systems which effected great reductions in the production costs of electricity.

Some technical changes afford opportunities for lower production costs than those of the old techniques. This seems to be the commonest characteristic of technological changes in utility industries. A more economical boiler or stoker for electric plants is developed; a new kind of pipe line, able to withstand higher gas pressures and to transport more gas, is available; the speed of streetcars and busses is increased. Technology also increases the optimum scale of operations, affording consolidation economies and making a large single scale of operation more economical than several lesser scales. Other technical changes in utility industries improve the quality of service. More comfortable buses or streetcars are developed; technical changes reduce the interruptions of electric and gas service; and innovations speed up telephone connections and give greater clarity to telephone conversations. Qualitative improvements of utility services obviously are beneficial to consumers. And since these improvements can lead to demand increases and to earnings increases, they can be beneficial to the companies too.

In other cases the obsolescence is a result of decreases in consumer demand. Buyers shift their demands from one utility service to another, or from a utility service to a nonutility service. Then obsolescence of the plant follows, and is measured by the diseconomies of excessive plant capacity. The company has unnecessary plant investments. And it can lose earnings unless prices and revenue increase so that the total costs, including the depreciation cost and investor return for the excessive plant, are fully covered. The case of interutility shifts in demand is demonstrated by the relation of telephone and telegraph companies. Some of the increases in the demand for teletype, leased wire, and general telephone service of the Bell system are obtained at the expense of telegraph business. More demand for telephone service can increase the obsolescence of telegraph property. A shift in demand from utility service and toward nonutility service is illustrated by the retarded growth and then the decline of the street railway industry. After 1915 the demand for automobiles increased rapidly, while urban transportation systems frequently suffered decreases in demand and large losses of earnings.

Companies and commissions often are not aware of obsolescence changes as soon as they occur. A casual observer may believe that equipment is not obsolete until it is abandoned. Or when a person looks at the depreciation accounting of a company, he is unaware of any plant obsolescence. The time and speed of obsolescence are anticipated in depreciation accounting as the service lives of property items are estimated, but it is not recorded as it occurs. Complete obsolescence of a property item can occur as a result of a single technical change, though it does not occur suddenly in most cases. It usually accumulates gradually, being built up by a succession of technical or demand changes. Partial obsolescence is a common condition; nearly all investments in utility plants probably are partially obsolete at any time. Any technical or demand change can make a utility plant somewhat obsolete, even though the amount of the partial obsolescence is rarely measured. But it takes a remarkable innovation, or a catastrophic demand decrease, or a succession of technical and demand changes to make expensive equipment wholly obsolete and to justify an abandonment of the equipment.

Legal Concepts. Courts and commissions recognize the presence of obsolescence. The Ohio Commission, for instance, sees that "the advance of an art is constantly making effective the element of obsolescence," and that obsolescence "develops gradually in proportion to the advance of the art."[3] Likewise, when a new kind of street railway car "can be operated at a lower total cost" than the existing cars, the New York Commission believes this cost economy "necessarily affects the value of the old car."[4] But most commissions give little attention to obsolescence of plant values. Preferring a simple procedure, they commonly lump obsolescence with general depreciation.

The service-life estimates of property, which usually are conservative and are not closely regulated by commissions, take account of possible future obsolescence. Although obsolescence is recognized in the service-life estimates, periodic depreciation charges are not related to the actual occurrence of obsolescence. Depreciation accounting does not make a special case of obsolescence accounting. One distinction, however, is made by some commissions. They speak of "extraordinary" obsolescence, "extensive" supersession, or "extraordinary and rare injury."[5] This kind of obsolescence, which the Supreme Court recognizes but does not call by a special name,[6] concerns a complete service abandonment such as that of gas lighting or street railways.

The Regulatory Problem. The general provision for depreciation expense is related to past investments. Depreciation accounting protects the equities of senior security holders; it protects the bondholders against payment of dividends out of recovered depreciation charges. And it safeguards the earnings expectations of the companies; the prices are high enough to cover the depreciation costs and to recover the past investments in depreciating equipment. Since the consumers use the depreciating plant, they pay for the consumption of plant investments. But this concept of depreciation accounting diverts attention from the peculiar regulatory problem of obsolescence accounting. Being confined to past investments, depreciation accounting obviously does not take account of investments in new and improved equipment. Yet the attraction of investments in a more efficient plant can be an important purpose of obsolescence accounting. Unless regulators allow the utility companies to write off the whole investments in old and obsolete equipment after new and improved equipment is installed, the companies are likely to withhold their investments in innovations. The private utility company, like any private firm, is guided by earnings expectations as it makes investments. One fact is certain: a utility company does not want to incur an earnings reduction when it improves the efficiency of its plant.

Unregulated companies do not experience the same conditions for obsolescence accounting as those experienced by regulated companies. An unregulated company, untroubled by commission control of depreciation charges and reasonable earnings, does not need to consider specifically the unamortized value or, as accountants say, the "unexpired" value of displaced equipment.[7] The important consideration, instead, is whether the company can obtain more earnings with the improvement. Let us suppose that an unregulated company has enough revenue to cover the depreciation charges as well as other service costs. Then an innovation appears. Now the important question is whether the firm can increase its earnings—whether it can increase the difference between total revenue and total operating expenses—with an investment in the improvement. There must be an increment in earnings; otherwise the company cannot cover the new depreciation cost and the investor return on the new investment. Before a firm discards obsolete equipment and invests in new equipment, it must foresee either an increase in total revenue or a decrease in total operating costs. This is true because the company wants to cover the depreciation charges and investor return for the old equipment, as well as the depreciation charges and investor return for the new equipment. It wants to recover both the old and new investments.

In past years the utility companies, too, often could act more like unregulated than regulated enterprises. Commissions undertook earnings investigations infrequently, leaving the companies long time intervals in which they could control their own earnings. General earnings and price investigations were rare rather than common experiences of most firms. Companies did not face revenue and price reductions as soon as they effected production economies; since the commissions were not likely to cut total revenue down to the costs of using the new equipment, the company managers apparently did not worry about the unrecovered depreciation charges.

More important, when retirement accounting was used, utility companies were not troubled by obsolescence accounting and the recovery of investments in old equipment. Free to charge the investment cost of discarded equipment to retirement expense at any time, managers could look wholly to new investment costs and prospective increments in earnings. If the latter seemed to cover the retirement expense of the new equipment and a return on the new investment, installation of the improvement was justified. In this era the utility companies freely invested in improvements and made many voluntary price reductions out of the economies. Infrequent earnings investigations and retirement accounting apparently benefited consumers in at least one way: investments in innovations were not discouraged.

But when earnings regulation is carefully done, depreciation charges for the old plant can affect a utility company's investments in technical improvements. Before the innovation appears, the firm, let us assume, receives enough revenue to cover the depreciation charges and reasonable returns on the old investment. The innovation does not alter this earnings situation; even if the company does not make use of the improvement, it still can recover the depreciation charges and returns on the old investment. Being sure of recovered depreciation charges and a reasonable return for the old investment, the company counts the depreciation cost of the old equipment and the return on the old investment as costs of making the new investment. It ties the old earnings situation to the new condition, counting the old earnings as a necessary condition of the new investment. And it expects the commission to do the same. When a company discards old equipment and takes up improved equipment, it certainly does not want to lose anything. Consequently a crucial problem of obsolescence accounting is the regulatory treatment of the unrecovered investment in obsolete equipment—the continuation of the old depreciation charges and old investment returns.

Installation of technical improvements can benefit consumers even before the investments in old equipment are fully charged to depreciation expense. The benefits are rate reductions or service improvements. Some of the technical economies of production can be translated into immediate rate reductions. Even if the depreciation costs and investor returns of the old equipment must be counted as costs of service, the total costs still may be lower with new than with old equipment. Rapid adoptions of more efficient equipment can be accompanied by rapid reductions of prices. But rate reductions are not lost forever, of course, just because regulators do not treat the old depreciation costs and reasonable returns as costs of innovations. Instead, a close-fisted policy of regulation delays the adoption of innovations. The change-over of equipment is delayed, perhaps, until the whole investment in obsolete equipment is charged to depreciation expense. Or the changes are delayed until the companies think they are not likely to be subjected to a general earnings investigation.

Sometimes the commissions cannot induce investments in innovations, even though plant obsolescence is fully accounted for. That is true when decreases in demand carry the company toward abandonment rather than replacement of its equipment. Street railways are a common example of this condition. The commissions can increase the fares of urban transportation companies; but when the demand for service is decreasing, higher prices do not always bring in more revenue and avoid obsolescence of old equipment. Nor should the commission always try to protect a utility company against contraction or abandonment of its operations. If the commission is interested in efficient use of resources, it can sensibly let one kind of service be replaced by another kind. It can let a decadent utility industry decay. The production of utility service is not something that needs to be preserved for all time at any cost. Having required depreciation accounting for the deteriorating equipment, commissions should not be expected to maintain the investment values of utility properties forever.

A REGULATORY POLICY

Measurement of the obsolescence value—the decline in property value because a more efficient means of operation is available—is the first step in obsolescence accounting. At the same time commissions and companies must determine when an innovation can be installed most economically. Yet, even if the measurement of obsolescence and the optimum time for a plant replacement are important factors, the crucial regulatory problem is the treatment of the unrecovered investment in old equipment. When a plant replacement occurs or is contemplated, some of the investment in the obsolete equipment is not yet charged to depreciation expense. As the accountants say, there is some unexpired investment. This unretrieved investment can be handled in several ways. The commission can amortize it out of the economies of the improvement, withholding some rate reductions until the amortization is complete; or the old equipment can be left permanently in the rate base; or the commission can refuse to consider the unrecovered investment, counting the depreciation cost of old property as an investor's cost rather than a reasonable service cost.

Measurement of Obsolescence. When an innovation affords a more profitable means of operation than that of the existing equipment, the measurement of obsolescence depends on the way in which the innovation affects a company's earnings. The improvement can reduce the variable operating expenses such as pay rolls or raw material costs, provide a larger output as a consequence of service improvements and demand increases, or produce some combination of cost and output changes.* A simple case, which is described here, illustrates the measurement of the obsolescence of existing equipment. With new equipment the production costs, either the capital or the operating costs, are lower than the production costs with old plant. The quality and the demand for service are the same for the outputs from both the old and the new equipment, and the productive capacity does not change.

Another factor affects the measurement of obsolescence and regulatory policy: some obsolescence cost usually is anticipated in the general depreciation accounting. When the service lives of property items are estimated, allowances commonly are made for the anticipated but unknown obsolescence. Trying to compensate for a limited knowledge of future obsolescence, the accountants, managers, and even commissioners make conservative estimates of useful property lives. If they make lucky guesses or very low estimates of these, the whole investment in some equipment can be written off to depreciation expense before a major innovation or a succession of improvements appears. Yet, even if all the depreciating investment is not written off prior to the innovations, at least some obsolescence is anticipated in the original estimate of property life. Some obsolescence is accounted for in the past depreciation charges. The *unanticipated* obsolescence is, consequently, the quantity that is measured for regulatory purposes.

When an innovation offers a more economical means of production but does not affect the demand or the service output, the unanticipated obsolescence is measured altogether by the cost economies. To simplify the measurement, we can assume that the company does not expect to obtain more than a reasonable return as long as the old equipment is used; the total revenue of any future year is not expected to exceed a return on a reasonable property value (e.g., investment cost), the depreciation charge, and the necessary operating expenditures of the year. Let us suppose that there is a difference, expressed by the symbol C, between the average production costs of the new and old equipment. Operating expenditures, depreciation charges, and fair returns—all of which are subject to commission control—are translated into unit costs of production for each kind of equipment; and the difference between them is the cost differential, C. The obsolescence is determined, in part, by what depreciation costs and fair returns the commission is expected to allow in future years. It is determined not only by regulatory allowances for old-equipment depreciation and investor returns, but also by commission regulation of new-equipment depreciation and returns. The cost differential, C, obviously is an estimate. And it is an average cost differential too. Maintenance, managerial, and other costs are not uniform from year to year, but an assumed uniformity of the annual cost differences simplifies this description of the general idea of obsolescence measurements.

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* As I have shown elsewhere, a long list of obsolescence situations can be compiled.[8]

When r is the regulatory rate of return on utility-company property, when n is the remaining years of depreciation charges (or estimated service life) for the old equipment, and when CU is the cost differential times the units of annual output in the old machine, the present value of the improvement to the regulated firm—the unanticipated obsolescence of the improvement—is equal to:

$$\frac{CU}{(1+r)} + \frac{CU}{(1+r)^2} + \dots \frac{CU}{(1+r)^n}$$

A summation of this finite series gives a general formula for obsolescence measurement:*

$$CU\,\frac{1-(1+r)^{-n}}{r}$$

Time of Replacement. What is the optimum time for the installation of an innovation? A technological improvement may be taken up immediately by a new or growing firm. If a company is starting operations or is expanding rapidly, the managers and investors want to install the most economical equipment; they want large increments in net earnings as additional investments are made. Perhaps a technical change is not suited to the production plans of a company; a small firm, serving a small market, is planned while the innovation offers economies of large-scale production. Some recent innovations, affording either cost economies or larger sales as a consequence of an improved product, usually are attractive to a company that is making new investments; additional earnings are always attractive to private investors.

This chapter is concerned primarily with another condition: replacements of old equipment with improved equipment. When an innovation appears, the utility company already has a plant with which all the available consumer demands can be served. Now the conditions of an innova-

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* If the annual variations in operating costs or capital costs are taken into account, the discounted present value of the benefits of the new equipment can be measured in the following manner:

$$\frac{[(O'_1+D'_1+I'_1)-(O''_1+D''_1+I''_1)]\,U}{(1+r)} + \frac{[(O'_2+D'_2+I'_2)-(O''_2+D''_2+I''_2)]\,U}{(1+r)^2} + \dots \frac{[(O'_n+D'_n+I'_n)-(O''_n+D''_n+I''_n)]\,U}{(1+r)^n}$$

The O' and O'' parts of the measure are the average operating costs for each operating period for the old and new equipment respectively, the D' and D'' and the I' and I'' items are the average depreciation and return allowances for the old and new equipment respectively, and U and r have the same meaning that they have in the general formula.

tion investment are different from those for a new or a rapidly growing firm. A private firm wants to do two things: recover the old investment out of future earnings, and get at least a reasonable return on the new investment. Unless the cost economies of the improvement are large enough to write off the remaining investment in the old equipment (unless the old equipment, as measured in the manner stated above, is completely obsolete), the company loses money on the replacement. The remaining investment, then, is an important fact. As the concept is used here, the remaining investment in a property item is the present value of the future depreciation charges and fair returns. If $D_1, D_2, \ldots D_n$ are the remaining depreciation charges, if $R_1, R_2, \ldots R_n$ are the remaining fair returns on the obsolete property, and if r is the regulatory rate of return, then the remaining investment is:

$$\frac{(D_1 + R_1)}{(1 + r)} + \frac{(D_2 + R_2)}{(1 + r)^2} + \ldots \frac{(D_n + R_n)}{(1 + r)^n}$$

And if $D_1 = D_2 = \ldots D_n$ and if $R_1 = R_2 = \ldots R_n$, then the remaining investment is $(D_1 + R_1)\frac{1 - (1 + r)^{-n}}{r}$. When the same property value is used to measure both the depreciation charges and the fair returns, the remaining investment can be approximated without a special formula. It is the "unexpired" property value that is not yet charged to depreciation expense. This simple version of the remaining investment can be called I_r.

A utility company does not willingly invest in an innovation until the production economies with the improvement seem to be large enough to amortize the remaining investment in the old equipment—until the earnings after the change are at least as large as they were before the innovation was installed.[9] The remaining investment and the unanticipated obsolescence are the basic determinants of a "break-even" investment in the innovation. Guided by these two facts, the company installs the improvement when

$$CU \frac{1 - (1 + r)^{-n}}{r} > I_r$$

The relation of innovation economies and the remaining investment does not measure the optimum time of all plant replacements. New equipment is not installed just because the remaining investment can be amortized out of innovation economies. When the depreciation charges are fixed for old equipment, the service lives of property items are estimated; conservative predictions are common. After the estimated service life passes and all the depreciation charges are made, there is no more remaining investment in the accounting sense. This does not mean that the old equipment should be scrapped—that the earnings are certain to be higher with the latest technical changes. Indeed, the company and commission are confronted with a new cost differential between the old and new equipment; the accounting costs of old-plant production are reduced because the old investment is fully charged to depreciation expense. A reasonable return and depreciation cost must be figured for the new equipment, but they are not rightly included for the old plant.* Perhaps the old-equipment costs, containing no depreciation costs and no investor returns, are lower than the new-equipment costs; only a price increase, further technical improvements, or future increases in maintenance costs can justify an abandonment. The facts about an innovation investment may change, but company managers and investors always endeavor to maintain their earnings as a minimum condition or to maximize their earnings as a preferable condition.

One Choice: Amortization. Let us continue with the case of an obsolete investment that is not fully charged to depreciation expense. An innovation makes the old equipment completely obsolete, but the company still has some remaining investment in the accounting sense. The remaining investment is an important factor in the regulatory policy that affects investments in innovations.† Choosing one policy, a commission allows amortization of the old investment out of the economies that are realized with the new equipment. Perhaps an improvement appears after the existing equipment is used only a short time; it appears long before the company is able to charge off the old investment to depreciation expense. No company gives up the old investment as long as it has a chance to recover some or all of it. Using the old equipment and counting its depreciation cost as a reasonable cost of service, it retrieves all or part of the investment. Controlled by private-company thinking, the depreciation cost of old equipment is a cost of an investment in more efficient equipment. So, to encourage investments in innovations, commissions can approve the amortization of obsolete-equipment investments.

When commissions allow amortization of the old investments after installing improvements, they must withhold some price reductions. Since the depreciation cost of old equipment is a cost of service that the consumer revenue is supposed to cover, all the innovation economies cannot be used for price reductions. At least some of the cost economies and additional earnings are used to write off the remaining investment in the obsolete, discarded part of the plant. After this write-off is completed, the rates can be reduced and customers get some benefits from the improvement.

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* If prices are not reduced as soon as the old investment is fully charged to depreciation expense, the company gets a windfall; the total revenue exceeds the total accounting costs of production. The firm may want to cover these windfall earnings before an investment is made in an innovation.

† The treatment of the old-equipment investment is more important in regulatory policy than the measurement of obsolescence or the optimum time of replacement. Company managers can allow for imperfect calculations of obsolescence cost, but they want to be sure that the old investment is respected after the new equipment is installed.

Amortization of old-equipment investments usually does not hold up rate reductions for a long time. Some of the obsolescence cost is anticipated and already is charged to depreciation expense. When the service life of the equipment was estimated originally, the probability of obsolescence was taken into account. Only the unanticipated obsolescence cost is not yet included among the service costs. Perhaps only a few years of depreciation charges remain. An alert commission, moreover, can hasten the recovery of the remaining investment. Using all or nearly all the innovation economies for the old-investment amortization, the depreciation charges are increased and price reductions are realized more quickly. A forthright amortization policy encourages the installation of innovations and assures price reductions (or service improvements) more quickly than a nonamortization policy. An amortization policy clearly delays a translation of the new economies into price reductions. But a nonamortization policy discourages investments in innovations, and can delay rate reductions even more than an amortization policy.

The Supreme Court considered amortization of obsolete plant investments in two cases. In the Kansas City Southern case the Court distinguished between the obsolescence that affected past operations (e.g., abandonment of a branch railway line), and the obsolescence that pertained to "demands of the future" (e.g., replacement of existing equipment "with stronger and more efficient instrumentalities").[10] The first kind of obsolescence, being a sort of "extraordinary" obsolescence, was not chargeable to future earnings; it was not a reasonable cost of utility service. But according to the reasoning of the Court, the other obsolescence costs ". . . are . . . chargeable to future earnings, for the reason that the improved condition of the road is not only designed to meet the demands of the future, but presumably will result in economies of operation. . . ."[11] In another case, the Pacific Gas & Electric Company case, a utility company incurred a cost of $46,000 for patents that made $800,000 worth of property obsolete. The private firm, being willing to share the cost reduction of 2½ cents a thousand cubic feet of gas with the customers, sought a rate base value of $4,000,000 for the patents.[12] Although the Court did not approve the company valuation of patent rights, it suggested that either a "fair valuation" of the rights or a "prompt recoupment" of obsolescence costs was reasonable.

Most state commissions have done nothing, one way or the other, about amortization of the remaining investment in outmoded equipment. In recent years they have encouraged the companies—indeed, they have pushed the companies—to make generous annual charges for depreciation expense. The current depreciation provisions unquestionably anticipate a larger part of the future obsolescence than was true of depreciation provisions before 1930. But most commissions still give no direct attention to the remaining investments in displaced equipment. Until the commission undertakes an investigation of earnings, a company can treat the displaced property as used and useful, and continue to make depreciation charges for the discarded property. The firm can treat the displaced property as stand-by equipment. By the time the commission investigates the usefulness of the outmoded property, the investment in the property may be fully recovered. And even during an earnings investigation the commission may not inquire carefully into the useful nature of the old, outmoded equipment. These are chances that utility companies must take as long as the regulatory policy for obsolescence accounting is immature.

A few commissions have expressed opinions on the amortization of obsolete plant investments. Some of them have approved amortization and others have disapproved it.[13] On the one hand, the Illinois Commerce Commission approved amortization when the company was ". . . able to generate electrical energy at a sufficient saving . . . to enable the remaining value of the old units to be amortized through operating expenses. . . ."[14] And the Missouri Commission observed that

> Sudden changes . . . are hazards of the industry and result in a loss to the investor unless the change benefits the consumer by offering him the same service at a lower rate or a better service at the same rate, in which case the superseded property should be amortized out of the rates paid by the consumer.[15]

On the contrary, the Missouri Commission, supported by the Missouri Supreme Court, said in another case that, ". . . when an appliance becomes obsolete by reason of scientific discoveries and inventions, it is a risk which investors in utilities must take. . . ."[16] Likewise, the New York Commission, deciding a case about the substitution of busses for streetcars, observed that the argument for amortization of the old investment ". . . ignores the right of the public to enjoy modern and satisfactory transportation . . . without penalty."[17] Denied the right to charge the amortization costs to buyers, the utility firms were forced to take them out of surplus accounts or out of future earnings. Sometimes the commissions allowed neither a reasonable property value nor an investment amortization. In most of these instances the property was very old;[18] the time was long past when the companies were expected to write off the property values to depreciation expense.

General Depreciation Policy. In obsolescence accounting, as in general depreciation accounting, some commissions may want to rely on the Knoxville rule. Under this rule the company's management is responsible for the adequacy of past depreciation accounting. At times a commission has good reasons, it seems, for the use of the Knoxville rule. Perhaps the company, failing to follow the commission's suggestions, made small depreciation charges under a full-reserve method of depreciation accounting. During this time the firm did not maintain its plant; it did not account for the consumption of plant investments. It preferred large, regular dividend payments. The common stockholders consumed the plant investment, using up the equities of bond- and note-holders as well as their own equity. Then a technical change, an important innovation, let us say, appears and offers more economical service production than that of the existing equipment. Now the company's management wants to charge the remaining investment in existing equipment to future consumers—the buyers who, of course, are to be served with the improvement. The stockholders expect the consumers to make up the past impairment of capital. This managerial solution of the problem obviously is unfair to the consumers. Given these or similar conditions, some regulatory opposition to amortization of the obsolete plant investments is well founded.

Yet an enforcement of the Knoxville rule can forestall installation of improvements. Even when inadequate depreciation charges and excessive dividend payments impair the capital of a company, the Knoxville rule can delay the use of innovations. Even when company managers know that they are responsible for the past depreciation policy, they still can withhold investments in improved equipment. Investment decisions are withheld, because the company usually is allowed depreciation charges for the old equipment as long as the equipment is used. If the old equipment is displaced, the depreciation charges are stopped and no more of the old investment is recovered. (This conclusion assumes, of course, that the commission is alert and can control earnings effectively.) Making up the deficiencies of past depreciation accounting, consumers sometimes can gain more than they lose. What is done cannot be changed by wishing that it was not done. If the consumers can gain something as they pay the amortization costs of obsolete plant investments, the commissions can afford to approve amortization of the investments and charge the costs to administrative inexperience. Thereafter the commissions can enforce a more conservative accounting for plant depreciation.

The Knoxville rule can limit investments, too, when ordinary, nonacquisitive accounting for depreciation is practiced. After an innovation is available, some of the old-equipment investment is not yet written off to depreciation expense. The company did not accurately anticipate the future obsolescence; the service-life estimate for the property was too high. If the Knoxville rule is strictly enforced, the company cannot amortize the remaining investment out of innovation economies. A strict interpretation of the rule makes the company responsible for inadequate depreciation charges. Such an application of the Knoxville rule is unreal. Future obsolescence is an unknown factor. Service-life estimates can turn out to be lucky guesses; they also can be poor guesses. Perhaps the appearance of inventions can be predicted, but the cost economies and earnings effects of innovations cannot be accurately forecast.[19] Unless consideration is given to these uncertainties, the utility companies are likely to be cautious about future investments. Or they make extremely conservative estimates of the useful property lives, and try to write off new plant investments quickly.

Another Choice. If they want an alternative for amortization of outmoded investments, commissions can leave the obsolete equipment in the rate (earnings) base. Depreciation charges for the outmoded, displaced equipment are stopped, but the company receives a fair return forever on the value of the old equipment. Present and future consumers pay this permanent return. If this policy is adopted, the future consumers pay returns on an accumulating amount of outmoded equipment. At first the consumers receive greater price reductions than they do with an amortization policy. The return on outmoded equipment obviously is lower than the return plus the amortization cost. Later, as displacements of equipment accumulate, there is an increase in the permanent return on outmoded property values. In time the accumulations can prevent further rate reductions, and even be the basis for rate increases. Meanwhile, too, the property accounts of the companies become congested with many abandoned, forgotten property items. Consequently the amortization of remaining investments in displaced equipment seems distinctly superior to a permanent return on the old property values. An amortization policy charges the unanticipated obsolescence cost to the present generation of consumers.

When the Pacific Gas & Electric case was decided, the Supreme Court apparently was willing to approve either a reasonable valuation for obsolete property or amortization of the outmoded property value. But in another California case, the Los Angeles Gas and Electric case of 1933, the commission disregarded a $3,000,000 valuation for an abandoned gas-manufacturing plant. The Supreme Court upheld the commission's denial of an obsolete property valuation.[20] Since the gas-manufacturing plant was ". . . not likely to be used for many years to come. . . ," the Court did not expect it to be included in the property valuation. These two opinions are dissimilar. One includes outmoded property in the rate base; the other excludes it. Perhaps the weight of judicial opinion is on the side of the Pacific Gas & Electric decision that deals directly with an obsolescence problem. But the legal status of the remaining investments in outmoded equipment still is unclear.

Commissions have refused to allow a reasonable property valuation and to grant a reasonable return on obsolete or displaced property.[21] The recent displacement of gas-manufacturing equipment, a consequence of technological changes in natural gas transmission, has presented a special case for such a policy. Some commissions, even those commonly having approved amortization of the remaining plant investments, have refused to allow a valuation and return for abandoned gas plant.[22] In other instances only a part of the obsolete property has been recognized in the measurements of a reasonable property value.[23] Yet, in innumerable other cases, commissions have said nothing about obsolete property, and have allowed companies to amortize the obsolete plant investments and to get a return on them.

Since no regulatory policy is fixed definitely for obsolete property investments, companies sometimes feel compelled to protect their investments by deceptive means. An important subterfuge is stand-by equipment. Outmoded equipment is not discarded completely. It is retained ostensibly to produce service if the regular plant breaks down or if the consumer demand increases suddenly. Commissions usually do not study the usefulness of idle, stand-by equipment.[24] They accept managerial judgments about the usefulness of inactive equipment. Yet, when the companies can devise some partial, continuous use for old equipment, they are better prepared to meet an investigation concerning useful property. Sale of mixed manufactured-natural gas is a way to make partial use of outmoded gas-manufacturing plants. This is done in some cities. Plants for gas manufacture suddenly are made obsolete by innovations in natural gas transmission. Protecting themselves against possible losses of depreciation charges and gas-plant returns, many distributing companies mix manufactured gas with natural gas and keep their manufacturing plants in operation. Even if straight natural gas service is more economical than mixed gas service, they still prefer the mixed service because it affords a way to protect the old investment values.

Price Reductions. When a company utilizes innovations and obtains additional earnings, commissions and consumers expect price reductions. The firm is expected to share its good fortune with the buyers. At first most or all of the additions to the total earnings are used, perhaps, to amortize the remaining investment in the discarded equipment. If so, the consumers must wait for substantial price reductions. Either before or after the remaining investment in old equipment is amortized, the company has more than a reasonable amount of earnings. The division of these extra earnings between consumers and company investors is a special regulatory problem for the commissions. The extra earnings can be (1) retained by the company, (2) taken by the customers in commission rate reductions, or (3) divided in some other manner between the customers and the firm.

Since they are regulated enterprises, the utility companies certainly do not have legal rights to all additional earnings from innovations. If commissions either award all the innovation earnings to the companies or do not take account of the earnings (as commissions often have done), they disregard the public interest in price and earnings control. On the other hand, if all the additional earnings are translated into price reductions, the commissions have an unwise and shortsighted policy. When all the savings from use of improvements are given to customers in rate reductions, no company is interested in the improvements. Even after an allowance is made for amortization costs, some innovation earnings must be left with the utility companies. Otherwise the investment inducements are weakened, further innovations are not installed, and some future reductions of prices are not obtained. There is no way, however, to determine the right division of innovation earnings between buyers and stockholders. Expressed in a general manner, a company's share is the amount that induces further investments in improvements. Yet, apart from experimentation in a rule-of-thumb manner, there is no way to measure exactly the increments in earnings that attract a certain amount of future investments. Perhaps the commission can do no better than to judge the proper division of earnings as each case arises.

Other Considerations. Even if all the necessary regulatory concessions are made to private companies, the improvements still may not be installed. Commissions usually do not direct the investment decisions of utility firms.[25] If a company declines to invest in an innovation, the regulators ordinarily accept the managerial decision. Commissions usually do not study the opportunities for reinvestments and new investments, and they do not closely tie up earnings control with investment decisions. Most regulators probably know nothing about many innovations until some companies install them. Yet commissions occasionally force utility companies to invest in improvements, believing that customers should not pay the high operating costs of outmoded equipment. And rate reductions sometimes are ordered because a "utility declines to use that method which is more economical," or because the "public is entitled to be served by a reasonably modern plant which is not wasteful in its methods."[26] Now and then the California Commission threatens to admit a more efficient company into a market unless the established firm adopts more efficient means of production. The California Commission really does not want competition of utility companies, but a threat of competition apparently can drive a lagging firm to make improvements far more quickly than can be done by persuasion or earnings regulation.[27]

Adoptions of technical improvements are slow, too, because cautious company managers are fearful of mistakes. Hired to acquire profits for the stockholders and to maintain good financial conditions for the bondholders, these executives hesitate to depart from conventional practices. They withhold investments in untried improvements because, in the event of mistaken investments, they are hard pressed to make explanations to their directors. At least some managers want facts about innovation economies before they plan investments. Having some of the characteristics of bureaucrats, they are more disposed to take chances on innovation investments after the less cautious managers reveal the cost and revenue characteristics of the improvements.

The effects of technological improvements on the employees also are considered by some company managers. Technical innovations usually economize the use of capital or labor. Since these innovations often increase the use of capital and reduce the use of labor, the labor unions have an interest in them and may resist their introduction. The railroad brotherhoods, for instance, oppose many technical innovations that can economize the costs of railroad service. Similarly, urban transportation employees sometimes oppose the use of one-man streetcars, or the substitution of large busses for small busses. When the employees of telephone, electric, and other utility industries acquire strong unions, they, too, may object to laborsaving innovations. Then, as they consider investments in technical improvements, utility-company executives must take account of "labor trouble" as well as prospective regulatory action, demand behavior, and cost conditions.

The uncertainty of future cost, demand, financial, and technical conditions limits the rapid adoption of technical changes. All utility companies can experience lower future demands for their services. Wary of demand decreases, an executive hesitates to make investments in improved equipment as long as the existing equipment is serviceable. Heavy investments in equipment are scarce, for instance, during the contraction and depression phases of a business cycle. And if the company must borrow before it can invest in technological changes, an unattractive market for new securities can delay the abandonment of outmoded equipment

Even when a firm can borrow cheaply now, it may anticipate that it can borrow more cheaply at a later time. Or managers may expect a large demand increase. If they do, they may put off innovation investments until the demand increases are experienced—until the optimum amount of plant expansion can be more easily calculated. And an expectation of further technical changes also delays investments in current improvements. In general the utility-company executives, who are not pressed by competitive conditions to adopt technical improvements, often seem to have a wait-and-see attitude toward innovation investments and other investments.

Chapter 17

The Rate of Return

ACCORDING TO the legal pattern of earnings regulation, the reasonable or fair return is determined by multiplying a reasonable value of property by the fair rate of return. Neither the property valuation nor the rate of return, taken alone, is significant in the regulation of earnings. Each must be determined by regulatory authorities, for the reasonable earnings, computed by multiplying the two, are most important. Since the property value and the rate of return are complementary in earnings regulation, a company does not get larger earnings just because it puffs up the property valuation. A commission can press down the rate of return while the company presses up the property valuation. This is really possible. No intense legal controversy, like the question of a fair property value, prevails about the rate of return. Judicial review generally is concentrated on property valuations instead of the rates of return. Yet, as an obvious fact, a difference of 1 per cent or even one-half of 1 per cent in the rate of return makes a large quantitative difference in the reasonable amount of earnings. When the property valuation is fixed, earnings are 20 per cent higher, for instance, with a 6 per cent return than with a 5 per cent rate.

JUDICIAL AND COMMISSION VIEWS

Both the courts and commissions commonly make brief statements about rates of return. They mention (and sometimes discuss briefly) the risks that utility-company investors take, but their decisions do not describe the way in which these risks affect the controlled rates of return. At times the rates of return apparently are measured by the interest rates paid on the outstanding securities of utility companies. In these cases the commissions are looking at the financial commitments and the financial status of each regulated firm. They are looking at the interest and dividend obligations, and trying to preserve the credit standing of each company. At other times the market rates of interest are the main guides.

Courts and commissions often say that a rate of return should be high enough to hold the old investors and to attract new ones. But the rate-of-return measurements are not clearly tied to reinvestments and new investments into utility operations. Neither the courts nor the commissions study investment opportunities, conditions of investment decisions, or ways to induce new investments. Utility companies certainly are guided by revenue and cost expectations as they contemplate security sales and investments. Indeed, the expectations of revenue, operating costs, and increments in returns seem to have more influence than the interest rates on investment decisions. Yet regulators commonly do not examine or comment on these expectations as they determine a reasonable rate of return and reasonable earnings. Commissioners even do not seem to realize how their own regulatory policies affect the managerial expectations of earnings and thereby shape investment decisions.

Judicial Decisions. The Supreme Court did not face the question of a fair rate of return until sometime after the property valuation problem arose. In the Smyth v. Ames decision the Court did not say anything about a rate of return. Not until the Willcox case was decided in 1909 did the Court comment on a proper rate of return. Then it observed that

> There is no particular rate of compensation which must, in all cases and in all parts of the country, be regarded as sufficient for capital invested in business enterprises. Such compensation must depend greatly upon cricumstances and locality; among other things, the amount of risk in the business is a most important factor, as well as the locality where the business is conducted, and the rate expected and usually realized there upon investments of a somewhat similar nature with regard to the risk attending them.[1]

Following a common judgment of bankers, businessmen, and economists, the Court made a general distinction between utility companies according to investment risks. Observing the risks of the Consolidated Gas Company, the Court was impressed by the fact that the firm had a monopoly of the gas business in the nation's largest city. Insofar as the Court could see, "an interest in such a business is as near a safe and secure investment as can be imagined with regard to any private manufacturing business. . . ."[2] Considering the several conditions of the case, the Court believed a 6 per cent rate of return was nonconfiscatory.

Ten years later, when the Lincoln Gas & Electric case was decided, the Supreme Court considered the effects of the First World War on public utility investments. A scarcity of investable funds, inflexible prices for utility services, and inflation of construction costs, raw material prices, and wage rates troubled the companies. Many firms either hesitated to expand their plants or were hard pressed to obtain capital. Thinking of these and other effects of the war on public utility operations, the Court said,

> . . . that annual returns upon capital and enterprise the world over have materially increased, so that what would have been a proper rate of return for capital invested in gas plants and similar public utilities a few years ago furnishes no safe criterion for the present or for the future.[3]

In the Bluefield case of 1923[4] the Supreme Court presented a fairly comprehensive, but not an incisively reasoned list of determinants for the fair rate of return. This statement, which still is representative of the views of the Court, was an extension of the Consolidated Gas decision. The Court said,

> What annual rate [of return] will constitute just compensation depends upon many circumstances and must be determined by the exercise of a fair and enlightened judgment, having regard to all relevant facts. A public utility is entitled to such rates as will permit it to earn a return on the value of the property . . . equal to that generally being made at the same time and in the same general part of the country on investments in other business undertakings which are attended by corresponding risks and uncertainties; but it has no constitutional right to profits such as are realized or anticipated in highly profitable enterprises or speculative ventures. The return should be reasonably sufficient to assure confidence in the financial soundness of the utility and should be adequate, under efficient and economical management, to maintain and support its credit and enable it to raise the money necessary for the proper discharge of its public duties. A rate of return may be reasonable at one time, and become too high or too low by changes affecting opportunities for investment, the money market, and business conditions generally.[5]

The Bluefield decision outlined the legal dimensions for the fair rate of return. But the Supreme Court did not explain what each determinant was or how it should be measured. Any respectable commission should exercise an "enlightened judgment" of "all relevant facts." Yet, in the absence of a judicial explanation, "enlightened judgment" can be exercised in forty different ways by forty commissions. In the last sentence of the quotation the Court tells the commissions that they should adjust the rates of return to changes in investment conditions, but lets the regulators determine how "opportunities for investments," the flow of savings, and the market rates of interest will affect the fair rates of return. Since it is a general statement of an objective, we should not cavil at the proposition that commissions should fix rates of return which "assure confidence in the financial soundness of the utility" and permit companies to borrow funds for investment. But a general statement is not enough for wise regulatory action. Under what conditions are investors confident of the financial soundness of a utility company? Failing to give answers to this and other questions, the Court leaves much to the discretion of the commissions. And the regulators can repeat the Court's phrases, saying that they make provisions for financial soundness.

One part of the Bluefield opinion is interesting but confusing: a utility company should have a return that is equivalent to the return of comparable business enterprises. This requirement, which also is mentioned in the Consolidated Gas decision of 1909, requires a return on the reasonable property valuation equal to the return "generally being made at the same time and in the same general part of the country on investments . . . attended by corresponding risks and uncertainties." The characteristics of similar business enterprises are not identified. Perhaps the steel, automobile, or agricultural-implement companies are operating under risks and uncertainties that are roughly comparable to the risks of utility operations. Only a few firms control the output of these industries; each seller has some known control of pricing, production, and selling practices; and the earnings are determined more by managerial than by competitive conditions. If the returns of public utility firms are measured by the returns of these industries, they are certainly above competitive returns. But the Court does not prescribe a monopolistic return, for it says, as a qualification of its comparative-return concept, that a utility company does not have a right to the returns of "highly profitable enterprises or speculative ventures." The meaning of the comparative-return requirement is not clear, unless the Court intends to say, simply, that the return should be high enough to attract investable funds to utility operations.

In the McCardle case of the twenties the Court found "evidence more than sufficient" to support a rate of return of 7 per cent.[6] And in 1930 the Court indicated in the United Railways case, a case involving a nearly bankrupt street railway company, that a 7½ to 8 per cent return was the minimum for avoidance of property confiscation.[7] In this case Justice Sutherland, who quoted liberally from the Bluefield opinion, added this dimension of the fair rate of return:

> Sound business management requires that after paying all expenses of operation, setting aside the necessary sums for depreciation, payment of interest and reasonable dividends, there should still remain something to be passed to the surplus account. . . .[8]

Just as commissions take account of interest obligations and dividend payments when fair returns are fixed today, so at the time of the United Railways decision commissions considered financial obligations in reasonable-earnings regulation. Allowances for depreciation costs, interest payments, and reasonable dividends were not new factors of earnings control. But when the Supreme Court said that something "should still remain . . . to be passed to the surplus account," it did add another factor of reasonable-return regulation. The Court apparently wanted to provide an earnings "cushion"—an extra amount of earnings in prosperous times that could be drawn on in depression years. But nothing was said definitely about the cyclical stability of the reasonable return. Perhaps the Court wanted simply a liberal return for utility companies, one somewhat above the minimum necessary or nonconfiscatory return.

As the depression of the thirties deepened, the Supreme Court was willing to approve lower rates of return. It went along with the commissions, recognizing the great decline in interest rates and the collapse of business earnings throughout the economic system. In the Dayton Power and Light case of 1934, where the company made an extravagant claim for property valuation, the Court approved a 6½ per cent rate of return rather than the 8 per cent that the company asked for.[9] Some members of the Court went further and considered rates of return below 5 per cent for successful utility firms. When Justice Stone dissented from the Chesapeake and Potomac decision in 1935, he suggested that a 4½ per cent rate of return—or slightly more than 5 per cent if adjustments were made for excessive depreciation costs—was nonconfiscatory.[10]

And in the Driscoll opinion of 1939 the Supreme Court approved a 6 per cent return that the Pennsylvania Commission fixed. In this case the commission considered the investor returns of other Pennsylvania utility companies, the current costs of borrowing, and other financial information. Looking at the financial condition of the company, the Court said,

> When bonds and preferred stocks of well seasoned companies can be floated at low rates, the allowance of an over all rate of return of a modest percentage will bring handsome yields to the common stock. Certainly the yields of the equity issues must be larger than that for the underlying securities. In this instance, the utility operates in a stable community, accustomed to the use of electricity and close to capital markets, with funds readily available for secure investment. Long operation and adequate records make forecasts of net operating revenues fairly certain. Under such circumstances a six per cent return after all allowable charges cannot be confiscatory.[11]

Here was an established company, firmly fixed in its market and able to make quite accurate forecasts of its future revenue. Backed by a good financial history, it could borrow cheaply and could prosper with a low rate of return. These financial economies of a "seasoned" company, like technical economies of operations, were convertible into price reductions.

The Natural Gas Cases. When the Natural Gas Pipeline case was decided in 1942, the Court upheld the Illinois Commission's choice of a 6½ per cent return. This company, whose gas transmission line was built from the Texas Panhandle field to the Chicago area during the depressed thirties, was viewed by the commission and the Supreme Court as a seasoned, successful enterprise. Even though the company was new, the Court thought it was ". . . exceptionally free from hazards which might otherwise call for special consideration in determining the fair rate of return."[12] Most of the gas was sold in the stable, growing Chicago market through affiliated distribution firms. And insofar as the Court could discern, the company was in the ". . . same position as other similar businesses with respect to increased taxation, inflation and costs of operation."

In the Natural Gas Pipeline decision the Supreme Court showed, in at least one way, a broader view of the reasonable rate of return than in previous decisions. For the first time it tied the rate of property depreciation and the rate of return together. Connecting these two related problems of earnings regulation, the Court implied that amortization of plant investments through depreciation charges should influence the choice of a reasonable rate of return. The Court said,

> The danger of early exhaustion of the gas field was fully taken into account in the estimate of its life. . . . Provision for the complete amortization of the investment within that period affords a security to the investment which is lacking to those industries whose capital investments must be continued for an indefinite period.[13]

There is an obvious connection between depreciation accounting and the reasonable return. If depreciation accounting and earnings regulation increase a company's chance for recovered investments, the uncertainties of investment decisions are reduced and the rate of return can be lowered. But the Court does not outline the way in which the depreciation and reasonable-return regulation should be united. Solution of this complementary relationship is left to the commissions.

A reasonable rate of return was an incidental part of the Hope Natural Gas case of 1944. Justice Douglas, who wrote the majority opinion of the case, spurned the method of fair valuation of property, telling the commission and the company that the result of earnings regulation was most important. Approving the earnings effect of a 6½ per cent return on the "actual legitimate" cost of property, the majority opinion allowed the firm only about half as much return as it wanted. The financial history of the company impressed the majority of the Court. During four decades of business the company paid more than $97,000,000 in cash dividends.[14] For twelve years before the commission made an investigation, the firm's earnings averaged 12 per cent a year on the original cost of property, and it accumulated a reserve for depletion and depreciation that was twice as large as the commission believed it should be on a service-life basis. But, apart from the Court's interest in these financial facts, Justice Douglas did not explain the Court's choice of a reasonable return. Preferring a simpler statement of the problem, he cited earlier judicial opinions on the reasonable rate of return, and used the language of the preceding opinions.

Looking backward over these opinions of the Supreme Court, one can see a general, somewhat subjective concept of a reasonable rate of return. Although financial facts influence the choice, they are not final, absolute determinants of the return. Administrative and judicial judgments as well as factual information and objective reasoning are controlling factors. Like the reasonable property value, a reasonable rate of return is what a sensible and informed man thinks it is. The Court lists factors that it expects the commissions to consider as fair rates of return are fixed. Determinants of return rates are enumerated, but the use of them is not carefully outlined. Just as jurists try to make reasonable decisions, so the members of the Supreme Court expect reasonable-return judgments from commissions. And, in recent decisions, the Court emphasizes the larger problem of a fair return rather than the subordinate problems of a fair property value or a fair rate of return. As Justice Douglas says in the Hope Natural Gas case, the whole result—the total return—is more important than the measurement of it.

Commission Opinions. The Supreme Court's concept of a reasonable rate of return has not disturbed commissions, though they have sometimes deplored the Court's doctrine of a reasonable property valuation. Phrases from Court decisions on the rate of return have become the standard language of commissions. Their judgment is an "enlightened judgment" of "all relevant facts"; their decisions reflect, they say, a consideration of "corresponding risks," preservation of the "financial soundness" of utility companies, and attention to "business conditions generally." Their choices of return rates are always reasonable choices. To defend their judgments, commissions like to list the factors that are mentioned in court decisions.[15]

Among commissions the current cost of borrowing is an important determinant of the rate of return.[16] Information on the current cost of capital can be obtained from the current sales of new utility securities, the yield rates on outstanding utility securities and other securities, and the general character of capital markets. Rates of return are changed either in proportion to or in the direction of interest-rate changes. During a depression, for instance, commissions often recognize changes in the costs of borrowing, lowering the rate of return as interest rates on bonds and notes decrease. Between the twenties, an era of much investing and relatively high interest rates, and the thirties, a decade of only a small amount of long-term investments and relatively low interest rates, the regulatory rates of return for utility companies decreased from 7 or 8 per cent to 5 or 6 per cent.[17] When the rates of return are adjusted to the current costs of capital, firms receive what it costs to attract new lenders. At these rates of return the companies are still able to "compete" for investable funds. This is an alternative cost measure of the rate of return; it is the rate at which investors are willing to lend funds to both utility and nonutility firms.

Commissions adjust the general market costs of capital to the financial conditions of individual companies, and they make distinctions between the investors' risks in utility and nonutility firms. When the Wisconsin Commission made an important and prolonged investigation of the Wisconsin Telephone Company, it said that "a business enterprise enjoying a complete monopoly, not harassed by competition, [and] rendering a service which has become an absolute necessity . . ." it should not be given the same rate of return that the nonutility companies received.[18] Among utility firms, a new enterprise usually is given a higher rate of return than a "seasoned" company.[19] A respectable financial history, an established market in a permanent-population area, conservative depreciation accounting in past years, and, in the case of natural gas companies, an adequate future supply of gas—these and other characteristics of the established company are considered as the rate of return is fixed. When the utility firm matures and some hazards for the investor disappear, the rate of return is reduced.

All changes in market rates of interest are not translated into rate-of-return changes. Commissions apparently do not desire a freely fluctuating rate of return. They are unwilling to base their rate-of-return measurements on the unsettled conditions of security markets. During a depression the commissions do not reduce the rates of return so much as the interest rates decline.[20] Nor do they want to squeeze the earnings to the limit and jeopardize the credit standings of the utility companies. Another reason also explains the moderation of the rate-of-return changes: frequent changes increase the administrative work of commissions. Some commissions, in fact, use the same return rates for nearly all the firms that they control. Many of them, like the Pennsylvania Commission, stuck to a 7 per cent rate of return for a long time, possibly because neither the buyers nor the companies complained.[21] Later, as the cost of borrowing decreased during the depression, a common rate of 6 per cent was indiscriminately used by many state commissions. The New York Commission defended such a standard rate of return, saying that

> It exceeds the actual cost of raising funds for a public utility in this State which is soundly financed and properly conducted. Any utility corporation which cannot earn for its stockholders an adequate return upon the basis of a 6 per cent return has neglected to conduct its affairs upon the basis of sound finance and engineering.[22]

Another cost measure of the fair rate of return is the historical cost of the capital of a utility company. In this case the financial commitments of an enterprise determine the rate of return. This rate is measured by the interest rates on outstanding bonds and notes, the fixed dividend rates for preferred stocks, and a "substantial" return on common stocks. A number of commissions believe that the historical cost of capital is a satisfactory measure of the reasonable rate of return.[23] Defending this measure, commissions argue that the credit status of the utility company should be protected. Accordingly, the minimum return for a utility firm is the amount of the annual financial charges—the interest charges, preferred dividend obligations, and a liberal allowance for common-stock dividends. To preserve the borrowing ability of successful companies, commissions can satisfy the bondholders' expectations of interest payments and stockholders' expectations of dividends. But when the financing of the company is imprudent or fraudulent, a financial readjustment or receivership is a more sensible solution than a high rate of return and an exorbitant total return.[24] Unless an overcapitalized firm is reorganized, the consumers must provide revenue which is used to pay dividends on unnecessary security issues.

The Massachusetts Method. The Massachusetts pattern of fair-return control is distinctive. Closely connected with a long-standing regulation of security issues, the Massachusetts control does not follow the common rules. Unlike other commissions, the Massachusetts Department does not base the reasonable earnings on property valuations. Although the Massachusetts Department accepts evidence of property values,[25] a reasonable valuation of tangible or intangible property never is an important factor in Massachusetts regulation. If an earnings base or rate base is used at all, it is the amount of money that bondholders and stockholders provide for utility operations. A prudent investment in a Massachusetts utility plant is the aggregate original investments of security holders—the proceeds of security sales. Reinvestments of earnings—the "plowing back" of surpluses—are not part of the prudent investments, though the companies are encouraged to build up their surplus accounts and to invest earnings in their plants. The reasonable return of a Massachusetts company is based on the system's total, regulated capitalization. Return control is designed to maintain the financial status of utility companies, providing enough earnings to meet past financial commitments and to attract new investors.

To measure a fair rate of return on the total capitalization, Massachusetts regulators do not have a simple formula. A former chairman of the Massachusetts Department said, in fact, that a fair rate of return was determined by "sound judgment."[26] The main problem is determination of the dividends that should be paid on the common stocks.[27] Common-stock dividends are supposed to be high enough to attract "fresh" capital; encouraging the issuance of common stocks instead of bonds and preferred stocks, Massachusetts regulators usually allow generous common-stock dividends, and try to maintain the market prices of common stocks. And since the Massachusetts Department controls the issuing prices of common stocks, it tries to keep up dividend payments so that the market prices of these stocks are as high as the original prices.

Dividend control in Massachusetts also is related to the requirement that a utility firm cannot issue common stock at a lower price than a par value of $100. If the dividends on common stocks are not high enough to keep the market price above $100, the firm obviously cannot issue additional common stock under Massachusetts law. When shares of stock cannot be sold for at least $100 each, the Massachusetts companies can obtain additional funds, to be sure, by selling bonds or notes. But this alternative does not jibe with the Massachusetts tradition of common-stock financing. Consequently, the par value requirement, which is related to the stock financing custom, is a further reason for the liberal-return control in Massachusetts. All this attention to dividends and security prices makes clear the fact that private investor interests come first in Massachusetts; provisions for dividend payments are put ahead of price reductions for buyers. This respect for investors is openly admitted by the Massachusetts commissioners. A former commissioner said, "We have got to see that these stockholders get a return, a good return."[28] Being so attentive to investors, the Massachusetts Department rarely is troubled with court litigation of its orders.[29]

INVESTMENT DECISIONS AND THE RATE OF RETURN

The conditions of total-return and rate-of-return-control are, basically, the conditions of investment decisions. Among the investment conditions are the revenue expectations of utility companies that do or do not induce new investments and reinvestments. Future changes in buyer demand, brought on by changes in buyers' tastes or incomes, are notably important. At the same time the regulatory policies of the commissions can influence the earnings expectations of utility firms and their investors. Another category of investment conditions contains the costs of plant expansions and plant improvements—borrowing costs, taxes, raw material prices, and wage rates.

Earnings Expectations. When utility companies make investment decisions, they, like unregulated enterprises, are guided by the anticipated cost and revenue conditions. The expected revenue from a plant expansion or a plant replacement is estimated. And as each plant change is contemplated, the future increments in material, labor, maintenance, and tax costs are subjectively measured. When the anticipated revenue exceeds the anticipated operating expenditures, adequately covers the depreciation costs and investor returns during the expected service life of the new plant, and adds something to the net earnings, the company is willing to make the new investment or reinvestment. The general rule is obvious: a firm does not make another investment in utility operations unless it anticipates an increment in earnings. Companies are not quite satisfied with break-even investments; they wish to anticipate more revenue than costs before making additional investments. As a further important fact, the net earnings are expectations, not certainties. The investing firms take chances that the anticipations of revenue, expenditures, and the service lives of new equipment are wrong. To compensate somewhat for possible errors, the companies can make conservative estimates of the future demand and liberal estimates of the future costs and technological changes. To the private investors and private companies, the increments in profits are more important than the additional service. Seeking more profits and facing no competition or only limited competition, utility firms probably do not borrow and invest more money until they are practically sure of getting larger additions to total revenue than the additional costs.

When a plant expansion or improvement is contemplated, the company managers can estimate the expected revenue and cost increments for each future year of the new equipment. Each lump of investment is associated, then, with an anticipated amount of revenue and an anticipated sum of costs. This is the typical manner of thinking among businessmen who are accustomed to the operating periods of accounting and lump-sum measurements of revenues and expenditures. These subjective expectations can be expressed, too, as expected rates of return on new investments or reinvestments. A certain rate of net earnings is anticipated on each dollar of investment; i.e., the difference between expected revenue on the one hand and expected depreciation costs and operating expenses on the other is translated into a percentage return for each dollar of additional investment. Economists use various terms when they describe this relationship between revenue and cost anticipations. Some of them, who like the Keynesian language, speak of the marginal efficiency of capital.[30] This is the relation, measured subjectively by investors and expressed usually as a ratio, between the expected yield and the supply price (investment cost) of the new capital asset. The supply price is the market price (acquisition cost) of the asset, or the price at which the manufacturer is induced to produce it. A company or industry can have a schedule of marginal efficiencies of capital; a separate marginal efficiency can be computed for each investment, each plant addition.

Nothing is so important and yet so uncertain in long-term investment decisions as the expectations of total revenue from successive plant investments. No company is sure of its future revenue, unless it has binding sales contracts. Although all companies commonly experience some uncertainties of demand and revenue, utility companies often are confronted with fewer uncertainties than nonutility companies encounter. Most utility enterprises have more complete control of their markets than nonutility firms. They usually are not much disturbed by competitive conditions, whereas the revenue of many other companies is affected by the pricing, selling, and innovation policies of rival companies. Yet the uncertainties of future revenue are significant for utility firms. Habits of buyers can change, because a new kind of rival service is introduced, or because the prices of substitutable services are changed. Before the First World War the street railway companies, for instance, prospered and could borrow cheaply and easily. But when automobiles became a common means of transportation, the revenue expectations of the street railway firms declined.

Cyclical changes in economic activity, which reduce the buyer incomes and lower the demands for utility services, have important effects on earnings anticipations and investments. Depressions are certainties in our capitalistic society. Given a period of prosperity, a capitalistic society is bound to experience a depression sometime. A lively optimism, abetted by an indifference to future events, supports the flow of private investments and stays a collapse. Persons may invest freely this year and for several more years, but they do not make unlimited investments in houses, buildings, and manufacturing plants. Given time to see their past mistakes and to suspect poorer future prospects of profits, they make fewer investments. Then, as the private investments decrease, the national income and employment decrease, too, unless the governments, particularly the federal government, spend more money and make up the deficiencies in private expenditures. Working without a large and carefully controlled government-spending program, a capitalistic system cannot avoid depressions. Consequently a utility firm, like any other firm, can be sure of future increases and decreases in the consumer demand. Yet, even if business cycles are certainties, no one really knows when a depression will begin or how intense and prolonged it will be. The time, duration, and full revenue or profit effects of the demand changes are not known.[31]

Even though utility companies cannot make perfect predictions of future costs, their expectations of expenditures usually seem to be more accurate than their expectations of revenue. After a new investment is made, further increments in a firm's expenditures consist largely of payments for labor, raw materials, and taxes. These current expenditures usually are not certainties for future operating periods. Sometimes they have stable characteristics and can be readily predicted; in other cases they are subject to economic and political forces that make their behavior somewhat uncertain. Over a period of years property-tax rates for each dollar of the assessed property value are quite uniform, but they are not absolutely fixed. When utility companies expanded rapidly before 1930, their managers probably did not anticipate the large increases in corporate income taxes that appeared after 1930. Prices of materials often vary widely during a trade cycle; some of them are almost as unpredictable as the demand for service. A further uncertainty is the long-run trend of raw material prices; at present the trend seems to be upward because higher wage rates, demanded and obtained by labor unions, are likely to be translated by many producers into higher commodity prices. Wage rates sometimes are stable throughout a business cycle. Yet union wage rates are not predictable for distant years, though they doubtless will be higher than they are now. As an upsurging labor movement creates strong unions in all utility industries, the union demands for wages and working conditions will be additional uncertainties of public utility investments.

Because the subjective earnings expectations are not certainties, investment decisions depend on what is often called the "state of confidence" of the investing firm. As Keynes says,* "Business men play a mixed game of skill and chance, the average results of which to the players are not known by those who take a hand."[32] As long as company managers lack definite factual knowledge about earnings expectations, they may solve their investment problems by following, in part, the "average" speculations of the professional statisticians and forecasters. Or they may follow the investment policies of other firms. When other firms are expanding their plants, the managers of a company can tell themselves that they, too, should expand; and when most other firms are not investing, managers of a single company often withhold their investment decisions. They follow the trend of the times, and have a popular investment policy. In this connection Keynes uses the apt analogy of a beauty contest in which the judges are awarded a prize for judging ability; the best judge is the person whose choices most nearly equal the average of the other judges' choices, who makes his selections according to his judgment of the other judges' choices. The follow-along solution cannot be a wise solution for each investing company, but it is an easy and comfortable solution in an uncertain situation.

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* Quoted by permission of Harcourt, Brace and Co., Inc., from *The General Theory of Employment, Interest and Money*, p. 150.

The confidence of borrowers about earnings expectations is a precarious base for investment decisions. If experience confirms their faith in past expectations, managers of companies feel buoyed up and are willing to undertake more investments. If experience shows gross errors in their earnings anticipations, they make more conservative estimates of future earnings and hold back further investments. Perhaps the mistake is a large one: the firm incurs large deficits where it expected more net earnings. An optimistic view of demand and cost behavior is upset, and the company considers a contraction rather than an expansion of operations. When this is a common condition in our economic society, the marginal efficiency of capital collapses and new investments are scarce.

Since most businessmen cannot foresee demand and cost conditions far into the future, they usually do not project revenue and expenditure expectations farther than four or five years.[33] They do not want to get too far away from known, current facts. Knowing present conditions, businessmen can make some matter-of-fact guesses about the near-by future conditions. Only a most venturesome person, however, is willing to say exactly what business conditions will prevail in twenty-five or fifty years. The managers of utility companies, which have very durable equipment, may make more distant predictions of revenue and costs than are made by other companies. They may be willing to look farther into the future not only because they have very durable plants, but also because the demand for some utility services is quite stable. Some consumers of gas, water, and electricity have an income elasticity of demand; they reduce their expenditures for utility services less rapidly than their incomes decline.* But other utility companies are subject to wide revenue fluctuations during business cycles. The demand for urban transportation service, for example, is largely a derived demand; the revenue of bus and street railway service decreases and increases with the general demand for labor.

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* The meaning of income elasticity of demand is discussed in Chaps. 2 and 19.

Interest Rates. The cost of borrowing is another factor of investment decisions. Even if he can save without any conscious sacrifice,* the owner of investable funds does not invest or lend unless the interest rate seems to cover the prospective loan risks. He is concerned chiefly with the risk of default. Measuring the chance of losing all or part of his funds, the lender (who has a preference for liquid funds unless he is paid to take chances) looks at the same uncertainties that the borrowing company considers. He makes his own estimates of the future earnings, examining the prospective revenue and costs of the borrowing firm. And when other commodities can be substituted for the products of the borrower, the probable demand for the substitutes and the prospective improvements of the alternative services are considered. The lender, like the borrower, is interested in future earnings expectations and is influenced by the prevailing business confidence. He is interested, furthermore, in the financial "cushion" that the company accumulates out of earnings. A conservatively financed enterprise, which does not pay out all its earnings, is insulated against some unforeseeable changes in earnings. Making investments out of earnings or accumulating cash, a firm builds up a financial cushion and reduces the chance of a financial reorganization. But a cautious financial policy cannot alter future demand and cost conditions.

In addition to the chance of default, there are other "cost" considerations of the investor. One of these is the risk of interest rate changes. If, after a loan is made at a certain rate of interest, interest rates for similar loans increase, the investor obviously loses some interest by lending at the lower rate. Such an interest loss is revealed in the security market; the price of his security declines so that the yield rates of new and old securities are balanced. This risk is insignificant for short-term loans; but it can be significant for long-term loans. There is another lending cost. A careful and intelligent bondholder or preferred stockholder watches the earnings and management of the company in which he invests. Keeping account of his debtor and his investment, he incurs a special cost of lending. Unless the interest or dividend payments are expected to cover this cost as well as other costs, he prefers to hold his funds.

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* Except in war years when consumer goods are scarce, persons in the higher income brackets, who are a small part of the total populace, do most of the individual saving. The distribution of incomes rather than the interest rate seems to be the main determinant of the saving done by these persons. Similarly, corporations apparently are not guided primarily by interest rates as they save. They often withhold some earnings as a "cushion" against expected or unexpected changes in expenditures or revenue, not as a response to interest rates.

Although economists speak abstractly of an interest rate, there is actually a family of interest rates. Rates of interest vary according to the length of the loans, the kinds of industries, the equity positions of the lenders, and so on. While all interest rates are related to each other in an economic system, they do not always move together.[34] Long-term rates do not fluctuate so widely as short-term rates; and sometimes the long-term and short-term rates move in different directions. Nor do interest rates on all kinds of long-term borrowing behave alike over a period of time. The predominantly long-term borrowing of utility companies illustrates this behavior of interest rates. Although both stock and debt financing are long-term borrowing, the prospects of dividend payments vary more than the anticipations of interest payments. The difference between the yield rates on stocks and bonds seems to be based largely on differences between the anticipated returns.[35] When they do get dividend payments, preferred stockholders, for instance, are paid more than the rates of interest on bonds. But the preferred dividends usually are not nearly so certain as the interest payments. Sometimes the prospect of dividend payments declines more than the chance of default on bond issues; if so, the prices of stocks decline more than those of bonds and the company prefers to sell bond issues. But during a recovery or prosperity period the opposite conditions can prevail; if they do, the company prefers to reduce its debt financing and increase its stock flotations.

Investment decisions are controlled by the relation of earnings expectations and the interest rate structure. The differences in interest rates and the differences in kinds of borrowing influence the investment decisions. If a company finances a plant expansion with debt securities, the limit of investments sometimes can be extended farther than with common-stock financing. The immediate costs of common-stock borrowing often are higher than the immediate costs of bond, note, or preferred-stock borrowing. At least the managers of utility companies usually think that they are higher. When a company voluntarily sells common stocks or is compelled by the commission to sell common stocks instead of bonds, the limit of investments is restricted. This is because the company is guided by the immediate cost of borrowing. Yet, while debt securities may have the lowest immediate costs of borrowing, they do not always afford the lowest future costs or long-period costs. Choosing bond and note borrowing, a company can impair its ability to borrow cheaply in the future and it can increase the chance of a receivership. The low, immediate interest rates of bond issues sometimes are deceptive economies. If the borrower looks far ahead, he must add something for the costs of a possible credit impairment and a receivership. If company executives, therefore, take long financial views, the choice of securities has less influence on utility plant expansion than it does in the case of short financial views.

A change either in the marginal efficiencies of capital or in the interest rates alters the limit of investments. Yet economists frequently observe that in investment decisions interest rates are less important than cost and revenue expectations.[86] New investments and reinvestments do not clearly vary with changes in interest rates, though utility companies, whose interest costs are significant parts of total costs, are certain to give more attention to long-term interest rates than is done by some other firms.[87] Interest rates commonly are low during a depression; but companies are not always anxious to take advantage of this condition, and to enlarge their plants. Revenue expectations seem to be the most important determinant of investment decisions. Expecting a decrease in demand, a company dismisses any thought of new plant investments. And it may defer plant reinvestments or the installation of significant technological changes. If demand actually does decrease, the firm does not need additional plant capacity. On the contrary, when a company confidently believes that the demand and earnings will increase in the near future, it is willing to build new plant and to utilize economical improvements. Investments often increase in spite of higher interest rates, but they do not commonly increase despite demand decreases.

A REGULATORY POLICY

When the current policies of utility commissions are studied, the most important determinant of the reasonable rate of return seems to be the cost of borrowing—either the current or past cost. Nothing at all is said about revenue and expenditure expectations of utility firms. Yet the expected marginal yield on assets seems to be more influential in investment decisions than the rate of interest. A utility company, quite as much as an unregulated company, is concerned about the expected marginal yield on existing assets and on additional plant. Commissioners do not seem to realize that investment decisions are controlled primarily by prospective cost and demand conditions. Nor do they seem to realize how regulatory action affects the expected marginal yields on public utility plant and thereby influences investment decisions. Regulation of earnings can have important effects on earnings expectations. When a commission is pressing for every possible rate reduction in every possible way, it can thwart new investments as much as a real or prospective collapse of buyer demand.

Announcement of Commission Policies. A commission can outline and explain its future earnings, price, and depreciation policies to the utility companies. What the commission does in a current case is not so important as what the firms think it will do in future cases. What the companies think the commission will do in the future can have telling effects on investment decisions. Companies can be told how often earnings and prices will be investigated, what rate of return will be reasonable, how obsolete property will be treated in depreciation accounting, what the orders for one firm will mean for other firms, and so on. If this is done, some of the uncertainties of investment decisions are minimized. This is an opportunity for regulators to exercise "enlightened judgment." On the contrary, if the policies of a commission are not announced or if they are unstable, the utility companies may conduct themselves as if the most aggressive and shortsighted regulation can be expected from the commission. When a commission is really generous in earnings and price regulation (as most of them seem to be), it should tell the companies about the liberal regulatory policies. If they never intend to have a restrictive earnings and price policy, commissions can encourage companies to take advantage of the policy and to extend the limits of investments so that utility operations are in accord with the liberal earnings expectations.

Relation to Depreciation Accounting. Commissions can formulate a policy of reasonable-return regulation that is really related to depreciation accounting. When full-reserve accounting for depreciation is required and annual charges are made to depreciation expense, a utility company is forced to recover the depreciating plant investments from current revenue. Some managers in the utility industries object, to be sure, to this form of depreciation accounting. Yet when the interests of all security holders are considered together, the companies gain something from full-reserve accounting for depreciation. The depreciation cost of operations is certain to be treated as a reasonable cost of service. And since the firms are allowed to recover their investments, their earnings expectations can be higher than they might be under a looser form of depreciation accounting, the chance of default on interest payments and loan repayments being reduced. If the risk of debt defaults and financial reorganizations is reduced, the cost of capital decreases. Tying depreciation and return controls together, commissions have a basis for either lower rates of return or enlargements of utility-company operations or both.

The Supreme Court recognizes the complementary relation of the reasonable-return and reasonable-depreciation cost. This relation was observed first in the Natural Gas Pipeline opinion of 1942; the value of the company's plant depended on the availability of natural gas in the Panhandle and Hugoton fields. Since the firm was assured "complete amortization of the investment," the Court believed that the company had greater security of its investment, and could afford a lower rate of return than that of some other companies. Commissions occasionally recognize a relationship between the rate of return and depreciation accounting—even the opportunity to lump the reasonable return and depreciation cost together in earnings regulation.[88] But most commissions proceed in the conventional manner, treating the measurements of depreciation cost and the reasonable return as wholly separate computations. They do not see any close relationship between depreciation accounting and earnings expectations. Here, then, is another place where commissioners can broaden the scope of earnings control.

Treatment of Obsolete Property. To facilitate investments in technological innovations, commissions can clarify the regulatory treatment of obsolete equipment. In this case, which is discussed extensively in the preceding chapter, the regulator is confronted with a relationship of investment decisions and depreciation accounting as well as fair-return control. Before a technical innovation appears and affords an opportunity to reduce costs of operation or to improve the quality of service, the existing equipment has a certain service life for accounting purposes. After the technical change is available, the commission can afford to take a shorter view of that service life; both the company and the consumers can get benefits from an improvement that makes old equipment completely obsolete. Use of the innovation need not be delayed until the old-equipment investment is fully charged to depreciation expense—until the old investment is fully recovered. But when a commission ignores the unrecovered investment in the obsolete equipment and translates the full economies of the innovation into price reductions, the utility company cannot afford to invest in the improvement. Guided by earnings expectations as investments are made, the company executives wish to use the innovation economies and the innovation earnings to (1) amortize the remaining investment in the old equipment, (2) receive a reasonable return on the same remaining investment in obsolete equipment, and (3) cover the minimum earnings expectations for the innovation investment. And the commission can afford to allow these depreciation charges and returns, because the consumers receive service improvements or price reductions from the new equipment.

Financial Commitments. As it regulates the reasonable returns of utility companies, a commission can give considerable weight to the interest and dividend requirements of firms. Being obligated to pay a certain amount of interest and preferred dividends each year and expecting some common-stock dividends as a mark of successful corporate operations, the companies usually believe that the interest obligations, the preferred-stock dividends, and reasonable dividends on common stocks are a minimum measure of a reasonable return. Even if the capital structures are poorly arranged and the total capitalizations are somewhat inflated, the companies still wish to count the interest and dividend obligations as minimum measures of reasonable returns. Unless a commission considers these managerial and investor expectations, the credit status of a utility company can be impaired.

Even though it dislikes the slightly overcapitalized condition of a firm, a commission cannot afford to impair earnings expectations and be responsible for higher costs of utility-company borrowing. In preceding years the commission had an opportunity to control the capital structure and capitalization; it had a chance to limit debt financing and to prevent overcapitalization. To atone for its past regulatory deficiencies, a commission can improve its future work rather than restrict payments to security holders and impair the credit standings of companies.[39] Yet the commissions do not wish to support the value of all financial obligations. If a company is greatly overcapitalized and cannot escape a receivership sometime, the commission can reduce the allowable earnings and compel an immediate reorganization. A commission sometimes must choose between two opposite financial policies: support the present capitalization of a company, or force the company into a receivership. The worst effect of earnings control is a credit impairment that limits new investments, but is not quite bad enough to justify an immediate receivership.

The Marginal Rate of Return. If a commission really wants to take an active interest in the attraction of investments, a distinction can be made between the average rate of return (or the whole return) and the marginal rate of return. The average rate of return is figured on the total investment—the total reasonable value of property; a marginal rate of return is figured on each additional investment. Such a marginal rate, which may or may not be prescribed by the commission, can be measured after the investment is made and after the additional returns start to come in. Dealing with actual facts, the company or commission computes the marginal rate of return as a ratio of the additional return to the additional investment; obtaining $7,500 from an additional investment of $150,000, a company gets a marginal rate of return of 5 per cent.

Another view of the marginal return is related to investment plans rather than investment results: when the directors of a company decide to make a plant investment or reinvestment, an additional return is anticipated. Under these conditions the marginal rate is an expectation —a ratio of the expected net return to the additional plant investment. Defined in this way, the marginal rate of return means the same thing as the marginal efficiency of capital. And it is controlled primarily by the earnings regulation, demand conditions, taxes, raw material costs, and wages that are anticipated in connection with the additional plant investment. Whether the marginal rate of return is measured as a real or an anticipated return, we still must not forget the distinction between the average rate of return and the marginal rate of return: the former is connected with past investments and existing plant values, while the latter is related to an additional new investment or reinvestment in the public utility plant.

When the marginal rate of return is defined as the equivalent of the marginal efficiency of capital, new light is thrown on the cost of capital as a measure of the reasonable rate of return. The marginal rate of return is controlled by managerial expectations—anticipations of regulatory action, demand behavior, and expenditures on additional service production. On the other hand, the market rates of borrowing are prices of capital. Clearly, then, the marginal rate of return is not the same thing as the cost of capital. Yet utility commissions use current costs of capital to determine the fair rate of return. Either the utility companies pay these borrowing costs, the commissioners say, or no borrowing can be done. True; but the utility company does not borrow unless the marginal rate of return is above the market rates of interest. The marginal rate of return is one side and the interest rate the other of a relationship that controls investment decisions. Interest rates are controlled by the conditions of capital markets; marginal rates of return either are fixed by commissions or are anticipated by company managers. Interest rates measure the cost of capital; marginal rates of return measure the prescribed or expected increments in net earnings. They are separate conditions that are related to each other as investments are made. Wishing to examine the opportunities for plant expansions and improvements and trying to attract new investments into utility operations, commissions consider more than the current borrowing costs; they also study the earnings expectations of the companies.

Commissions usually do not investigate the earnings expectations of utility-company managers—the anticipations concerning wages, raw material prices, maintenance costs, taxes, demand changes, and regulatory actions. They do not ask what additional earnings the companies seem to want before additional investments are made. Leaving these matters out of reasonable-return control, the commissions do not need to make distinctions between the average and marginal rates of return for companies. And the attraction of new capital, in which the commissions seem to be interested, is a simplified problem. Current costs of borrowing or the interest and dividend obligations of the company can be used to measure the rate of return on both old and new investments. Using the current costs of capital, a commission provides a return on old investments that is equivalent to the current investor returns; the company gets what the present lenders are willing to take. On new investments the company receives an additional return that is equal to the additional borrowing costs; it receives the minimum costs of the new investments.

Measurement Difficulties. The marginal rates of return, defined as the marginal efficiences of capital, seem to be the most significant facts of investment decisions. But the commissions are certain to be troubled as they try to use them—as they try to make a practical distinction between the average and marginal rates of return and as they endeavor to control the reinvestments and new investments. One problem is the uncertainty of earnings expectations. Future costs of labor are subject to changes in labor market conditions and union policies; raw material prices can increase or decrease as a result of business and technical conditions, though they may be more predictable than the wage rates; taxes usually are more stable than either wages or raw material prices, but most companies cannot be sure that they will get tax relief or will avoid higher taxes in the future; important technological changes can appear suddenly in the future, and make even the new equipment completely or partially obsolete; commission regulation of earnings and prices is not fixed and definite for all time; and changes in consumer demand usually are the most important uncertainties. Dealing with earnings expectations of utility companies, commissions can clarify their regulatory policies, but they cannot control the future demand and cost conditions. Factual information is available concerning interest rates. But there is commonly no simple way to measure the earnings that a firm expects from a plant replacement or plant enlargement. Even the company executives may not know exactly what their earnings expectations are for possible investments, though they may find some information in their own past experiences or the experiences of other companies with similar plants and markets. Based on uncertain conditions, the marginal rate of return cannot be easily measured and used; it is not reducible to precise computations.

The marginal efficiency of capital is not stable. It varies from year to year, and at the turning points of business cycles it may vary from month to month. Based on the investing firm's uncertain judgment about future business conditions, the earnings expectations fall at one time and rise at another. When the marginal efficiency of capital collapses everywhere, a public utility company is less willing to invest even if the commission allows a liberal amount of earnings. In the midst of a depression only a high marginal rate of return can induce the utility firms to invest. Another consideration is the unused plant capacity as the demand for service decreases. Companies do not care, of course, to make additional investments in unused plant capacity. Having abundant equipment, they treat additions to their earnings as windfalls, not as inducements for new plant investments. On the other hand, when the demand for service increases, idle plant capacity disappears or is greatly reduced, the confidence of managers and lenders improves, and commissions have a better opportunity to adjust the marginal rates of return so that companies can be induced to make new investments and reinvestments in their plants.

Estimating the marginal efficiency of capital and trying to exercise some control of additional investments, a commission faces a third problem. It must adjust the marginal rate of return to the financial condition of each company. The marginal rate of return still is not the same thing as the cost of capital, but the cost of borrowing usually determines the minimum level at which it can be fixed to attract private investments.* In this connection a commission considers the established capitalization and capital structure because they affect a firm's cost of borrowing. Investing carefully and making economical use of successive security issues, one company has a conservative financial history; the firm seems to have a reasonable total capitalization. Paying high prices for property acquisitions, issuing securities somewhat freely and being incautious generally in financial transactions, another company has an unattractive financial history; such a firm seems to be overcapitalized. When a company has a conservative financial history and does not have a large total capitalization relative to the output capacity, it usually can borrow more cheaply than the firm whose past investments and security issues are not carefully managed. As a marginal rate of return is prescribed, so that the regulated firm is induced to borrow and invest, the commission must choose between the total capitalization as it stands, and an adjustment to a reasonable capitalization.

Measuring a marginal rate of return that will attract new investments, a commission also must consider the variations in borrowing costs for different capital structures and different security issues. When a company has a large amount of indebtedness and only a small amount of outstanding common stock, it usually cannot borrow as cheaply on new stock issues as if common stock already is predominant in the capital structure. The risks of common-stock investments or other junior securities increase as the bond-stock ratio increases. Even if the differences in

* This is a relationship of the borrowing rate and the marginal return that is discussed earlier in the chapter. Wishing to make money, a firm commonly does not seek funds and plan investments when the marginal rate of return is less than (or even when it is not greater than) the interest or dividend rate on new borrowing.

capital structures are neglected, the cost of borrowing varies with the choice of new security issues. Counting only the immediate costs of borrowing, utility-company managers commonly believe that money can be borrowed more cheaply with bond issues than with stock issues. Interest rates on debenture bonds are higher than those on mortgage bonds, and interest rates on income bonds are still higher. Similarly, when a choice can be made between preferred- and common-stock issues, companies think that the preferred stocks are the cheaper source of investable funds. Wishing to encourage the sale of common stocks as new investments are made, a commission must allow a marginal rate of return that is higher than the average cost of capital and higher than the cost of bond or preferred-stock financing. Since a firm does not invest unless the additional net earnings are expected to exceed the additional borrowing costs, the marginal rate of return must be adjusted to the kind of security that is issued.

Trying to encourage reinvestments in utility plants and to attract new capital, a commission has two general choices for reasonable-return regulation. It can fix a liberal average rate of return as most commissions do now. This rate can be higher than the company's own average of interest and dividend obligations; and it can be higher than the average cost of new capital. Undertaking another kind of return control, the commission can differentiate between the average rate of return, which is figured on past investments, and the marginal rate of return which is connected with new investment plans. When a marginal rate of return is used to control the new investments, the commission does not have a simple regulatory problem. Revenue and cost expectations are not certainties; the expectations can vary from year to year, and the marginal rate of return must be adjusted to differences in security issues, capital structures, and total capitalizations. Plain, factual rules cannot be fixed for the measurement of the marginal rate of return, though continuous control of returns (which is described in the next chapter) can be used to adjust some mistakes of regulation.* Yet, even if the measurement and control of the marginal rate of return is uncertain, a commission broadens earnings regulation as it studies the current investment conditions and looks forward to new investments. Some experimentation and speculation can improve the matter-of-fact regulation of reasonable returns.

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* Using continuous control of returns, a commission can allow an additional return with the understanding that a certain investment will be made. If the firm does not make the investment within a reasonable time, the regulators recapture the additional return with price reductions or new service obligations.

Chapter 18

Continuity of Earnings Regulation

WHEN A commission fixes the reasonable earnings of a public utility company, it commonly relies on current and historical costs. Looking at the accounting records, the commission can tabulate the operating costs of the current year—or recent years—the expenditures for labor, management, taxes, advertising, raw materials, and plant maintenance. Both the reasonable return for investors and the depreciation cost are figured on either the investment cost or the first original cost of useful property; they are figured on past plant costs. The annual accounting charge to depreciation expense, which is based on the estimated service lives of property items, usually is considered a good measure of the reasonable depreciation cost. To compute a reasonable rate of return, the regulator customarily looks at the current and historical costs of borrowing. Summing up these data on operation expenses, the depreciation cost, and the reasonable return, the commission has the total reasonable cost of present service. It has a convenient accounting measure of a reasonable revenue that is controlled by the available facts. Comparing the current reasonable cost with the current total revenue, the regulator knows (or believes he knows) whether the prices are excessive, deficient, or reasonable.

Commissions commonly do not try to predict future changes in consumer demand or operating costs. They know that the current costs and revenue are not likely to be the future costs and revenue—that labor unions often force up wage rates, governments change the rates of taxation, raw material prices fluctuate, and consumer demands are not stable for long time periods. Yet as the earnings are investigated and prices are adjusted, commissions usually assume that the total production cost and total revenue do not change. An allowance is not even made for changes in consumer purchases as lower or higher prices are fixed; a perfectly inelastic demand is assumed for the service. Encountering cases, for example, where the total revenue exceeds the reasonable total cost, the commissions reduce prices and intend to equate cost and revenue. This is a planned equation for future operating periods—for periods after the price changes are made and before another investigation is completed. But the planned earnings for future periods are not certain to be the actual earnings of the periods, because cost and demand changes can and probably will occur. Utility companies are not assured reasonable returns and consumers are not certain to pay reasonable prices as the earnings are regulated.

Excess returns are not recaptured, and earnings deficiencies are not paid. When a company has an actual return above a reasonable return, the commission does not take the excess away from the firm. Such an excess may suggest a need for an earnings investigation and a price reduction. But the past returns are not affected by the regulation; even a notably excessive return still is left in the possession of the company. Taking a consistent view of less than reasonable earnings, commissions do not make up past deficiencies in actual returns; companies can ask for price increases so that the deficiencies are not repeated in the future, but they must bear the actual losses. Actual returns of past years are not counted in current regulation, and are not integrated with future returns. Each case is decided on its own cost and revenue facts; a current decision may change the future earnings, but it does not alter the experienced earnings effects of past decisions.

CONDITIONS OF CONTINUOUS CONTROL

The present control of earnings clearly is not continuous. If commissions wish to establish a pattern of continuous earnings regulation, they turn excess past returns into current price reductions and make up deficiencies in past returns with current price increases. Differences between actual and reasonable returns are balanced; the balancing process is continuous, because any planned return is not expected to equal exactly the actual return. A company can anticipate a reasonable return over a long time period, but the return of each year is not expected to be reasonable. Under these conditions a decision of a commission, involving either a price increase or a price reduction, is not final; it is subject to reconsideration as the earnings experiences of the company unfold in the future.

A General Plan of Control. Imperfect knowledge of economic conditions is a primary reason for continuous earnings control. Regulating in a dynamic and unstable economic system, a commission cannot be expected to plan perfectly the reasonable returns of public utility companies. The demand, cost, managerial, and technical conditions of production are not certainties. As regulators look ahead, they cannot say just what net returns a company can get with prescribed prices. Buyers' demands change as their incomes and tastes change, improvements in appliances appear, or substitute commodities develop; after prices are prescribed, a new technique of production may be discovered that economizes the production costs; managerial efficiency is not a constant of service production; and costs are subject to uncertain taxation, labor union policies, and general economic conditions. Yet the commissions must fix prices and reasonable earnings today for future service. Forced to make immediate decisions for future situations, regulators cannot hope to choose prices that provide no more or no less than reasonable returns. The planned and reasonable return, which a commission fixes on the basis of current facts rather than complete information, usually is not equal to the actual return. Continuous regulation compensates for an incomplete knowledge of regulatory conditions.

If a commission sets up a continuous plan of earnings control, the actual earnings are adjusted when they are smaller or larger than the reasonable earnings.[1] The actual earnings are not the untouchable property of the company. Knowing the uncertainty of demand and cost behavior, the commission does not expect the planned earnings to be equal to the actual earnings of a company. Each earnings decision is treated as a tentative, approximate judgment that is likely to be revised after the actual earnings are obtained. If a certain amount of earnings is planned and a lesser amount actually is received by a company, the commission takes the deficiency into account when the next investigation is undertaken. The deficiency in the realized earnings is added to the costs of service when the reasonable earnings again are planned. And if the actual earnings exceed the planned earnings, the commission pares down the allowable earnings at the time of the next investigation. Windfall earnings go to the consumers, not to the company. And deficiencies in the actual earnings are charged to customers; companies are assured reasonable returns insofar as the demand and cost conditions permit these returns. Nearly all companies can count on reasonable returns; only a few companies, operating in decadent industries such as the street railway business, cannot recoup their deficits with any prices.

A continuous pattern of earnings control can be adapted to case-by-case regulation. At one time a commission decides what a reasonable return and a reasonable price structure are; at a later time it considers the difference between the actual (past) returns and a reasonable return, and adjusts the company's price level upward or downward. These adjustments can be made every year, or they can be made irregularly. Perhaps a commission, exercising its own judgment of a good regulatory procedure, revises the actual returns only when a significant price change can be made. Another form of continuous control is based on a fixed procedure; several of these procedures are discussed later in this chapter.

A measurement of the reasonable return is specified; computation of the depreciation cost, investor return, and operating expenses is defined for any year. A further part of the fixed plan concerns the way in which price changes will be made. When a definite plan of continuous regulation is used, both the commission and the company know the standards and methods of earnings control. But a flexible form of control, relying on commission judgments and working from case to case, is more adjustable to changing economic conditions—to changing measurements of reasonable returns.

To encourage efficient management of utility companies, a commission may not want to recapture all excesses or restore all deficiencies in the actual returns. If a prospering and expanding company loses all earnings above a reasonable return, the managerial policies of the firm are certain to be affected by the regulation. The continuous control of earnings can affect the business behavior of men who are hired to run the companies, or the dominant stockholders who manage their own firms. Either the hired managers or the managing stockholders want to be efficient because they want additional earnings. Even the hired management, working for a holding company or individual stockholders, has a strong interest in earnings and dividends; this management is tested by the earnings and dividends that it can produce. Held absolutely to a reasonable return and denied a share of new earnings, the owners or hired managers do not search vigorously for more sales or try to make the most economical expenditures. Since the firm gets the same return regardless of its efficiency, the managers do not work hard and take chances so that the additional earnings can be translated into price reductions for consumers. Investments in innovations are deferred; unnecessary employees stay on the pay roll; new markets are exploited cautiously or they are not developed at all. At least the company "saves" some cost economies and market enlargements for more difficult times—for times when there is less assurance of reasonable returns because the consumer demand is decreasing, or because labor costs, taxes, and raw material prices are increasing.

Continuous earnings regulation must be adjusted to the private control of new investments, operating expenditures, and market expansion. Efficiency and expansion of utility operations are important considerations of earnings regulation. Given these conditions, the commission takes away only part of the excessive returns and restores only part of the deficient earnings. The thriving or efficient company gets more than a reasonable return; the decadent or inefficient company is not assured a reasonable amount of earnings. But, even though a commission is willing to modify the continuous earnings regulation, it does not know just how it should split the excesses and deficiencies between the investors and consumers. The regulators do not know exactly how much additional return induces future investments in the desirable technical improvements, further expansion of markets, and efficient controls of current expenditures. They are forced to estimate the best divisions of additional earnings. The commission can guess that a 50-50, 75-25, or some other split of the earnings differences is all right, but it never can be quite sure that more managerial efficiency, more technological innovations, and more market expansion cannot be realized with some other division of the excessive or deficient earnings.

Continuous earnings regulation can be used to compensate for uncertain demand and cost conditions. But this is not its only function. This regulatory procedure also can be used to correct a commission's mistaken judgments of what the earnings should be. Since the control of reasonable earnings is associated with private investments, it is a long-period problem. Yet a commission must make current decisions, fixing the earnings that seem to be compatible with private investments. When a commission fixes the current reasonable return and the current depreciation cost for a company, it does not have enough information to make a perfect decision. It does not know all the future facts that can affect investment decisions—the returns on all alternative investments, technological changes, new taxes, changes in labor and raw material costs, the increases or decreases of consumer demand. And the commission can fail to comprehend the current earnings expectations of private investors. These possible errors of commission judgment show up after the reasonable earnings are fixed—even as long as ten years after the investor returns and depreciation charges are fixed. Having continuous earnings regulation, the commission can make belated changes in the reasonable earnings. When these errors of judgment are apparent, the commission recaptures part of the excessive earnings and restores all or part of the earnings deficiencies. Reasonable earnings can be planned and prescribed every year, but no planned amount of earnings is a final determination. Broadening the time dimension of earnings control, commissions can tie the reasonable returns more closely to the private investment decisions.

This procedure not only corrects mistaken commission decisions, but also facilitates experimental pricing. Lacking knowledge of demand curves and demand elasticities, commissions do not know what revenue effects follow from price reductions. The companies, too, do not know the exact revenue effects of price changes. When their losses of revenue cannot be recouped from future earnings, utility companies do not like to offer price reductions even if they have some chances of profitable increases in total revenue. Instead, they make the buyers "earn" price reductions: prices are not reduced until excessive returns are obtained at established prices. Companies can afford to take chances on price changes, however, when the deficiencies in actual earnings can be recouped out of future earnings. Seeking a further expansion of service, a commission can reduce prices and wait for the revenue effects of the new prices. If the demand turns out to be inelastic and the company earnings are deficient, prices can be increased to cover the shortage. On the other hand, if the demand turns out to be elastic and the company still obtains reasonable earnings, the buyers receive lower prices and additional service more quickly than otherwise.

The Judicial Views. The legal status of continuous earnings regulation is unsettled. Some decisions of the Supreme Court seem to reject restoration of past earnings deficiencies and recapture of excess earnings; other decisions approve or seem to approve adjustments of current earnings according to the reasonableness of past earnings. When the Court decided several cases before 1930, it did not count the past earnings as factors in the current earnings control. In the Knoxville Water decision of 1909 the Supreme Court said that utility companies could not recover the past depreciation costs from future consumers. When a utility company, according to the Court's judgment, fails to "exact sufficient returns to keep the investment unimpaired, . . . the fault is its own."[2] And in the Galveston opinion of 1922 Justice Brandeis, speaking for the Court, said the company ". . . cannot erect out of past deficits a legal basis for holding confiscatory for the future rates which would . . . otherwise be compensatory."[3]

In the Knoxville and Galveston decisions the Supreme Court did not approve a continuous relationship between the past and future earnings. Relying on these decisions, commissions were not compelled to make up the past deficits of utility companies. And the Court, being consistent, decided that excessive past earnings could not be used for future price reductions. In the New York Telephone decision of 1926 the Court said, "The revenue paid by the customers for service belongs to the company."[4] In this decision possession was the important legal fact about actual earnings. Since the company possessed them, the realized earnings were the property of the firm and the commission could not take them.

On the other hand, recapture of excess railroad earnings was approved by the Supreme Court. The recapture procedure, which is discussed in the next section, was a main part of a Congressional plan to control the railroad rate level. Recognizing this fact, the Court said that a company ". . . is not entitled, as of constitutional right, to more than a fair net operating income upon the value of its properties. . . ."[5] The Lindheimer decision, made in 1934, can be interpreted to approve continuous earnings control.[6] When reasonableness of telephone rates was judged in this case, the Court looked at the financial success of the company rather than the fair return on a fair property value. And the Court told the Illinois Commission that it could reduce the current depreciation charges, if the past charges, measured by the company's claims for observed depreciation, were excessive. The Hope Natural Gas decision, too, seems to afford judicial support for a continuous pattern of control. Subordinating the method of earnings control, the Court says that the ". . . result reached . . . is controlling." [7] Interpreted literally, the Hope decision allows a continuous method of control as long as the result is reasonable.

The decisions of the Supreme Court apparently have not had any significant effect on plans for continuous earnings control. Several such plans, which are described later in this chapter, have been used in this country. Sliding-scale arrangements and service-at-cost agreements were used in some American cities before 1925; a continuous plan of earnings control started in Washington, D. C., in 1924; a similar plan was applied to a New Jersey electric company in 1944. These plans were not forced on the companies; they were negotiated between company managers and public authorities, and did not require judicial approvals. Meanwhile, the other local governments and state commissions did not order continuous regulation for unwilling companies and test the legal limits of the control. Even the Washington and New Jersey plans are not copied by other commissions. The rarity of continuous earnings control seems to be explained more by the indifference of commissions than by the decisions of courts.

Railroad Recapture Experience. The experience with recaptured railway earnings also may seem to be against any further use of continuous regulation.[8] When the Transportation Act of 1920 was passed, railroad companies were required to give up half of their excess returns to the government. Defined in the Transportation Act, the reasonable return of a railroad company was 6 per cent of the fair property value. If a railroad company obtained more than a 6 per cent return, it had excessive earnings and was subject to the recapture clause. Half the excesses were supposed to be recaptured. These excess returns were put in two funds: one-half was placed in a "reserve fund" that was kept by each company, and the other half was paid into a fund that was held by the Interstate Commerce Commission.

The recapture clause was planned as a solution for what was called the "weak-strong road problem" of railroad regulation. When several railroad companies served an area, either the rates had to be uniform or the railroad with the lowest rates obtained a disproportionate share of the business. Choosing a uniform rate policy, the Interstate Commerce Commission allowed some railroads to get more earnings than others. The recapture clause was designed to take the extra earnings away from the strong railroads. The recaptured earnings, which were held in the government fund, were to be used for loans to weak roads, though the loans obviously could not alleviate permanently the financial troubles of the struggling roads. The railroad companies, demanding returns on reproduction valuations of property, tried to avoid payments to the government fund. They tied up the recapture procedure in court litigation. Despairing of effective earnings recapture, the ICC conceded that the experiment was a failure. And the recapture clause was repealed in the Emergency Transportation Act of 1933.

The failure of the recapture clause is certain to stand in the way of any plan that ties past and future earnings together. As soon as continuous earnings control for all companies is proposed, the experience with railroad regulation will be recalled. The company opponents of continuous earnings regulation will make the most of the railroad example. But the recapture clause and the general idea of continuous earnings control are not alike. The clause was a possible solution of the weak-strong road problem, a way to balance the earnings of competing railroads that did not have equal opportunities for earnings. On the other hand, continuous earnings regulation simply balances the past and future earnings of any individual company; it lengthens the time dimension of earnings regulation. Recapture of railroad earnings worked only one way: half the excessive returns of any year were recaptured, but none of the deficient returns of other years were restored. Continuous earnings regulation works both ways: the excess returns of a company are recaptured, and deficient returns are recouped out of future revenue.

SEVERAL SPECIAL PATTERNS OF EARNINGS REGULATION

Local governments and state commissions have not always adhered to discontinuous earnings regulation—the familiar case-by-case method of control. Devising formulas for reasonable earnings or reasonable price measurements, they have tried occasionally to set up automatic controls of actual earnings. None of these special forms of earnings regulation have been full-fledged examples of continuous earnings regulation; the past earnings have not been closely related to future earnings, and the planned earnings have not been tied up closely with plans for future service production. Some continuity of earnings regulation, however, is evident in these special patterns. When sliding scales are used, price changes are related to changes in common-stock dividends. And when the service-at-cost, Washington, and New Jersey Plans are used, the property valuations, rates of return, and operating expenses are prescribed, rates are subject to periodic revisions, excess returns can be used for immediate price reductions, and deficient returns are restored out of a reserve or are corrected with price increases.

Simple Sliding Scales. Introduced about 1875 for the control of English gas companies, the early sliding scales commonly allowed a one-fourth of 1 per cent increase in stock dividends for each penny reduction in the gas prices. A subsequent revision, which was called the "standard sliding scale," fixed a maximum dividend rate of 10 per cent. This price-dividend form of control was applied to gas service in Boston in 1906. A standard price of 90 cents a thousand cubic feet of gas was fixed; the standard dividend was 7 per cent on the par value of stock; and for every 1-cent reduction in the gas price there was a one-fifth of 1 per cent increase in the dividend rate. This agreement had a term of ten years. In 1916 the Board of Gas and Electric Light Commissioners renewed the plan for another ten years, but it was discontinued in 1920 after the World War inflation forced the gas price to $1.50 a thousand cubic feet.

Sliding scales were established, meanwhile, in a few other cities.[9] They were adopted, for example, in Dallas and Houston, Texas. The Dallas and Houston agreements illustrated how sliding scales sometimes were particularly beneficial to utility companies. The Dallas sliding scale, which was adopted in 1917, fixed a basic return on a prescribed property valuation of 7 per cent, and a maximum electricity price of 8 cents a kilowatt-hour for residential service. Encouraged to share additional earnings with consumers, the company was allowed an increase of one-half of 1 per cent for the first four half-cent reductions of the maximum price; and additional half-cent reductions in the maximum price were to be accompanied by increases of one-fourth of 1 per cent in the investor return. Until the city of Dallas forced reductions in the basic electricity price and did not give the company a higher return at the same time, the company stabilized the electricity price at 6 cents a kilowatt-hour and received a 9 per cent rate of return.

These sliding-scale plans are crude forms of earnings control. Contrary to utility regulation as it is practiced in this country, they are based on the assumption that companies should not be expected to reduce prices unless they are given larger returns. Yet, even when this assumption is accepted, regulators have a puzzling problem about price changes. They must relate the return changes to price changes. Trying to be efficient, they wish to offer only the increments in dividend rates that induce the desired price reductions. But since the public authorities do not know the future technological changes and cost changes, they cannot choose precisely the reasonable operating costs during the term of a sliding-scale agreement. A sliding-scale relation of prices and dividends does not recapture excess returns or restore deficient returns; it does not provide continuous adjustment of earnings. The Boston type of sliding scale, moreover, gives a utility company an opportunity to receive monopoly returns. Using such a simple type of sliding-scale agreement, a company is not required to reduce its price below the point where the earnings seem to be maximized. A price of 6 cents a kilowatt-hour apparently was considered the profit-maximizing price under the original Dallas agreement after an allowance probably was made for the political risks of a return above 9 per cent.

Service-at-cost Franchises. In 1910 a service-at-cost franchise was adopted in Cleveland. When the street railway industry was prospering, the regulation of its fares was a chronic problem in Cleveland and many other American cities. A service-at-cost franchise afforded a basis for periodic, objective revisions of the fares. And the First World War created special conditions for transportation fare revisions. During this war there were many conflicts about the price provisions of ordinary franchises, because street railway companies, pressed by inflated production costs, needed higher rates to avoid receiverships. To solve these regulatory problems, service-at-cost agreements were negotiated in some cities. About two dozen of the franchises were adopted, principally between 1917 and 1922. These agreements, which appeared at the end of the local era of utility regulation, represented the highest level ever reached in earnings and price control with franchises.

Service-at-cost franchises were supposed to provide a flexibility of prices so that revenue could cover the expenditures and the allowable returns of utility companies. Since there were, of course, many differences between the franchises,[10] attention is given here to the general characteristics of a service-at-cost franchise. Such a franchise fixed an initial property valuation, and prescribed the measurements of later property valuations as plant changes occurred. And the rate of return on the property valuation was specified. Limitations were put on the operating costs that were includable in the service costs. Sometimes the costs of service were controlled by franchise definitions of the proper costs; in other cities the company budgets were approved by city authorities. Initial prices of service, which were based on reasonable costs of the prevailing service, were specified in the franchise. These prices were subject to later changes, because the company was entitled to a reasonable return; it was supposed to get an annual return equal to the fixed property valuation times the rate of return. Differences between the actual and allowable returns were the reasons for price revisions: prices were increased when the actual return was less than the allowable return, and were lowered when the actual return exceeded the allowable return. In some plans a stabilization reserve fund provided even more continuity of earnings and price control. All the deficiencies in the actual earnings of a company were paid out of the stabilization reserve fund; and all excesses were placed in the fund. Prices were increased or decreased when the fund fell below or went above a certain figure.

The service-at-cost franchise could be used to effect more frequent and continuous regulation of earnings and prices. When a stabilization reserve was used, the excesses and deficiencies in past earnings were accounted for in future price changes. Continuous control is the most attractive feature of the service-at-cost franchise. But this form of earnings control was not designed to widen the limits of street railway service. Earnings were not controlled so that new investments could be stimulated. Rather, service-at-cost franchises provided automatic price adjustments so that the street railway companies might obtain reasonable returns on the available properties. These franchises were designed, for the most part, to preserve the existing transportation services when the companies experienced increases in operating costs and decreases in demand.

This method of earnings and price control did not get away from the valuation problem, though agreements on property valuations reduced the regulatory conflicts. The allowable return was fixed for the term of the franchise. Consequently the price effects of a service-at-cost franchise turned on the choice of the property valuation. If this was inflated because useless property was included or because consideration was given to reproduction-cost valuations, consumers paid high prices for transportation service until the franchise expired. Depreciation charges could be based on the expected service life of equipment and could be fixed for the term of the franchise, though some franchises did not adequately provide for depreciation accounting and the measurement of depreciation cost. For most other expenditures specific amounts could not be fixed, however, because neither the company nor public officials could anticipate all future expenses. Control of most expenditures, even in the best agreements, was left to company managers. Some franchises contained specifications about the frequency of railway service, the size of cars and their repair, maintenance and replacement of track, and the routes of transportation service. But technical and demand conditions changed frequently, and specific service conditions could not be sensibly fixed for a number of future years.

The Washington Plan. After sliding-scale agreements and service-at-cost franchises were abandoned, consumers and public officials did not lose interest in formulas that provided continuous, automatic controls of earnings. They were not always satisfied with intermittent, case-by-case regulation. And they usually wanted to settle troublesome and constantly recurring conflicts, notably the valuation problems. After 1925 the public interest in continuous earnings regulation was maintained by the Washington Plan.[11] Following an apparently endless rate controversy, the Potomac Electric Power Company and the Public Utilities Commission of the District of Columbia agreed in 1924 to a regulatory plan. And in 1935, after the commission had satisfying experiences with the electric company plan, a similar sliding-scale arrangement was adopted for gas service. These plans resemble the service-at-cost franchises as well as the sliding-scale agreements; fixing definite measures of the depreciation cost and the reasonable return and providing periodic rate revisions if the reasonable return is larger than the prescribed return, they have the basic characteristics of a service-at-cost agreement; dividing the excessive earnings or deficits between the investors and consumers, they work on the main principle of sliding-scale arrangements.

Like the case method of regulation, the Washington Plan based the reasonable earnings on a property valuation. In the original electric agreement the property valuation of the company was fixed at a figure that was about 30 per cent above the investment cost of the property. And the initial valuation of gas company property, which was fixed at $21,000,000 in 1935, seemed to be even farther above the investment cost. All property additions were counted, however, at their investment costs. As a consequence of plant expansion (the electric and gas systems expanded, of course, as the government activity and population of Washington grew) and plant replacements, an investment-cost base was certain to be established in time. But the commission did not wait for the eventual elimination of property values that were above their investment-cost values. When some corrections were made in the electric plan in 1944, the commission reduced the basic property valuation to the investment cost [12]—to the "capital actually invested" in the plant.* It eliminated the excessive valuations that still remained from the 1925 valuation. Now the basic valuation is an allowance for working capital and the investment cost of property less the book reserve for depreciation.

The basic or reasonable earnings under the Washington Plan resemble the reasonable earnings of any rate case. To determine the reasonable earnings of a current year, the commission multiplies the basic property valuation by a basic rate of return. The electric company started with a basic rate of return of 7½ per cent; and the original rate of return for the gas company was 6½ per cent.* The electric company's rate of return was reduced to 7 per cent in 1931, to 6½ per cent in 1935, to 6 per cent in 1937, and finally to 5½ per cent in 1944.[17] In other words, when the company prospered under the Washington Plan and when the cost of capital decreased, the basic rate of return was reduced. Studying bond and preferred stock yields and the dividend-price ratios of utility stocks, the commission always tried to relate the basic rate of return to the cost of capital.

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* The District of Columbia Commission also uses the term "original" cost in connection with the new valuation.[13] But it does not say anywhere that the new valuation is the "first" original cost—the adjusted book cost under accounting regulation.

The company is not restricted to the basic return. If more than the basic return is obtained in any year, the additional return is kept by the company; the actual returns belong to the firm. And if the actual return is below the basic return, the company bears the loss.† But excesses or deficiencies in the actual returns are the basis for annual price changes. This is where the sliding scale comes in. If the actual rate of return in any year is between 5½ and 6¾ per cent, one-half of the excess earnings are used for rate reductions; if the rate is between 6¾ and 7½ per cent, three-fifths of the excess earnings go to the customers in rate reductions, and three-quarters when the actual rate of return is above 7½ per cent. But when the actual rate of return decreases below 5½ per cent for two successive years or below 5 per cent for a single year, the prices are increased so that the rate of return can be brought back to 5½ per cent.

The actual earnings of each test year rather than forecast earnings are used as the basis of the annual price adjustments. As the total costs of each year are measured, the commission does not fix any definite efficiency standards for labor or raw material expenditures. But it does take account of federal taxes as earnings and price adjustments are computed. And depreciation charges are fixed. When the electric plan was adopted, the commission and company chose a partial-reserve method of depreciation accounting.‡ The calculation of depreciation expense was changed in 1944: an annual depreciation rate of 2.7 per cent was fixed for the electric company. Now the commission studies the service lives of property items, and uses a full-reserve method of depreciation accounting.

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* Seeing evidence of a decreasing cost of capital, the commission ordered a reduction of the gas company return in 1943.[14] It chose a return rate of 5¾ per cent. But when the company appealed the case, the U.S. District Court reversed the order because the commission did not allow a large enough return for common stockholders.[15] Then the commission fixed a 6 per cent rate of return.[16]

† This is a difference between the Washington Plan (as well as the New Jersey Plan that is described later) and the continuous earnings control that is outlined in the first part of the chapter. The Washington Plan does not recapture excessive returns or restore deficiencies in the returns; actual returns do not balance out to a reasonable return in long-period operations.

‡ When the depreciation reserve was less than 15 per cent of the property valuation, the depreciation rate was 2.3 per cent. The rate of depreciation charges was gradually decreased as the depreciation reserve approached 20 per cent of the property valuation. And no depreciation expense was included in the basic-return computations after the depreciation reserve exceeded 20 per cent of the property valuation.

The Washington Plan did not prescribe any definite distribution of excess earnings between the buyer classes. Initial rates were approved for the several kinds of buyers. Thereafter the company and commission agreed each year, apparently without difficulty, on the changes in the rate schedules. Before 1930 residential electric rates were reduced more than commercial rates, but after 1930 the price reductions for commercial buyers were increased. Control of the electric rate structure was not the main purpose of the plan. Periodic regulation of earnings, rather than nondiscriminatory pricing or maximum service consumption, was the principal objective.

Effecting frequent and sometimes large rate reductions, this plan pleased customers. Except for 1924 when no rate change was made, electric rates were reduced every year between 1925 and 1945.[18] For nine of these years the earnings reductions exceeded $500,000 a year. Between 1925 and 1945 the total reductions, including a large reduction in 1944, were $9,420,565.[19] The average electricity price decreased from about 5 cents a kilowatt-hour to less than 2 cents a kilowatt-hour.* Yet, when these rate reductions were effected, the credit of the electric company was not impaired. After 1925 the company borrowed frequently, and expanded more than twofold in fifteen years. Sharing in the excess earnings, the firm obtained more than $16,000,000 of extra earnings in two decades.[22]

The Washington Plan has some obvious merits. Although the company and commission are in conflict whenever the basic return is revised, the plan eliminates some regulatory controversies. Fixing a definite, factual measure of reasonable earnings, the plan avoids many of the customary struggles about earnings and price control. Second, rates are subject to revisions every year. Unlike other utility firms, the Washington companies do not keep excessive earnings for long periods of time. Third, part of the excess earnings are used for price reductions, and deficiencies in actual earnings are corrected with price increases. Earnings regulation is a process that revolves around a basic (reasonable) return, even though this form of continuous control does not recapture the actual excesses or restore the actual deficiencies in past earnings.

The effectiveness of the Washington type of earnings control depends, of course, on the selection of a basic return—on the choice of a basic property valuation and a basic rate of return. Bargaining with each other, a company and commission can choose an initial property valuation and rate of return that favors customers and promises some price reductions. Or a high property valuation and rate of return that protects the current earnings of the company can be chosen. As the electric price reductions demonstrate, the plan works well in Washington. When it was originally drawn up for the Potomac Electric Power Company, the District of Columbia Commission had a good bargaining point. A public electric system for the District was under consideration. Even so, the initial valuation was somewhat higher than the original cost of the property. And the excessive valuation was not corrected until 1944. Meanwhile the commission scaled down the basic rate of return as the cost of capital decreased. These are problems for any commission or municipality that uses the Washington Plan. A poor valuation bargain or a high rate of return can destroy the effectiveness of the plan.

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* On the other hand, the gas plan produced smaller price reductions than the electric plan. And the gas company obtained a sizable rate increase during the war. This earnings increase, which totaled slightly more than $200,000, was opposed by the Office of Price Administration.[20] But the Supreme Court upheld the action of the commission and allowed the Washington Plan to operate during the war.[21]

The Washington Plan of earnings regulation should be related to investment decisions. This is another reason why the basic rate of return is an important factor. If the commission or city has plans or hopes for service expansion, the basic rate of return should be related to these. The rate of return ought to be connected with the private earnings expectations. Not only the cost of capital but also the revenue and operating-cost anticipations should receive attention. The District of Columbia Commission emphasizes the cost of capital and neglects the cost and revenue expectations of the electric and gas companies. And this commission, like other commissions which still use the case-by-case method, does not distinguish between an average and marginal rate of return; the companies get the same rate of return on their whole investments that they get on every new dollar of investment. Even though the basic rate of return is much lower now than it once was, both the electric and gas companies in Washington are willing to invest in more plant capacity. The real test of the capital cost measure will come, perhaps, when the prices and operating costs are stabilized or begin to rise—when the companies cannot look forward to more excess returns.

The basic rate of return should be related to the kind of securities that the company issues. If the basic rate of return is as low as 5½ per cent, the utility company may not be induced to issue common stocks instead of debt securities. The cost of common-stock financing usually seems to be higher than 5½ per cent. Under the Washington Plan the Potomac Electric Power Company financed plant expansions principally with excess returns and bond issues. The indebtedness of the company increased so rapidly, in fact, that the Securities and Exchange Commission warned against the ultimate effects of debt financing.[28] This is clearly a defect of the Washington Plan. But it can be remedied. The basic rate of return can be varied with capital structure changes. A differentiation can be made between the average basic return and the marginal basic return; a higher return than 5½ per cent of investment cost can be allowed on new plant that is financed with stock issues. When the company does stock financing, the basic rate of return can be raised so that its increment covers the increment in capital costs; and when mortgage-bond financing is used, the basic rate of return can be reduced. As in the New Jersey Plan that is described in the next section, the basic rate of return can be measured annually by the company's cost of capital.

The Washington Plan seems to be most effective when it is applied to expanding companies. It reduces prices as the consumer demand increases, and as cost economies are realized. During the thirties the demand for electric and gas service increased steadily in Washington, the expanding center of New Deal government. And the demand increases continued between 1940 and 1946 when Washington was the congested center of wartime government. Demand increases, particularly for electric service, probably explained a large part of the earnings and price reductions under the Washington Plan. Likewise, this plan can effect large, immediate price reductions in the industries where important technological changes are occurring. Many cost-reducing innovations appeared in the electric industry between 1920 and 1940. But the manufactured gas industry matured before the rapid expansion of the electric industry began. The Washington demand for gas service did not increase so much between 1930 and 1940 as the Washington demand for electricity; and no notable cost economies, apart from improvements in natural gas transmission, were realized for gas service. These differences were possible explanations of the moderate gas-rate reductions in Washington.

The New Jersey Plan. After the Washington Plan provided continuous earnings regulation for a decade and effected large electric rate reductions, consumers and local governments, in an effort to simplify the procedure of earnings control, often proposed "automatic" regulation of utility-company earnings. Several plans, which resembled the Washington Plan, were put into operation.[24] In 1935 one of these, the Detroit Plan, was adopted by the city of Detroit and the Detroit City Gas Company.[25] If the gas company obtained more than the "base" earnings, it retained half of the first $550,000 of the excess earnings and a quarter of further excesses. The remainder of the excesses were refunded to domestic customers who lived in one-family and two-family dwellings. When the Detroit Plan was drawn up, measurement of the base earnings was not clearly explained, the calculation of annual depreciation charges was not prescribed, and the company selected the initial rate schedules. Before this short-lived plan was declared invalid by the Michigan Supreme Court in 1937, it produced only one small refund. The Detroit Plan was a poorly constructed form of earnings regulation that seemed to be no better than the intermittent, case-method regulation of a weak commission.

In 1944 another and more promising plan was adopted by the New Jersey Commission and the New Jersey Power & Light Company.[26] Under the New Jersey Plan, which is patterned along the lines of the Washington Plan and does not have a fixed term, the basic return is determined by multiplying the basic rate of return by the prescribed property valuation. If the experienced return is less or greater than the basic return, a stabilizing reserve makes up the deficiency or holds part of the excess. After the stabilizing reserve is less than 1½ per cent or more than 4½ per cent of the prescribed property value, the electric rates are increased or decreased. Under this plan the company earnings are examined every year, and the stabilizing reserve eliminates frequent, even regular annual changes in rates. Service prices can be more stable than they are under the Washington Plan. A formula is prescribed for the measurement of the reasonable earnings, accounting data are used to measure actual earnings, and differences between the prescribed or reasonable earnings and the experienced or actual earnings are divided between the company and the customers.

The New Jersey Plan started with a basic property valuation of $16,750,000. This valuation was higher than the first original cost—the cost of the property when it was first devoted to public utility service. It was the prudent investment (less depreciation) that included allowances for overhead costs and property acquisitions above the first original cost.[27] All subsequent additions to the plant are figured at their prudent-investment costs. To determine the base property valuations of a current (test) year, the company and the commission add (1) the original valuation of $16,750,000, (2) net property additions (additions less retirements) less the change in the depreciation reserve between January 1, 1944, and the beginning of the test year, (3) one-half of the net property changes (additions less retirements) during the test year, (4) one-half of the increase or decrease in the depreciation reserve during the test year, and (5) the accumulated amortization of some property values.[28] This property valuation is not the whole valuation of a test year; an allowance for working capital, computed according to the company's fuel requirements, necessary supplies, operating expenses, and lesser needs for cash, is made.*

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* The working-capital allowance of any test year is: (1) average book cost of fuel, supplies, and materials that are on hand at-the end of each month, (2) one-ninth of the operating expense deductions (exclusive of taxes, depreciation expense, and interchange

The original deduction for accrued depreciation was less than the amount of the depreciation reserve. But the deduction was not so small as the company, seeking a liberal initial valuation of property, wished to make it. Compromising their contrary views of the accrued depreciation, the company and the commission split the difference between the "existing" depreciation, as measured by engineers, and the adjusted depreciation reserve. Changes in the accrued depreciation deduction are not based, however, on compromises. As the above valuation formula indicates, increases or decreases in accrued depreciation are measured altogether by changes in the depreciation reserve and are not subject to engineering "observations."

The basic rate of return is measured by three components: the actual cost of debt capital, the actual cost of preferred-stock capital, and the earnings rates on the common stocks of comparable companies.* Controlled primarily by the present interest and preferred-dividend obligations, the first two components are readily computed. But the third part, the return on common stock, is determined by a more complex procedure involving many averages and adjustments. An earnings-price ratio (a ratio of the income available per share of common stock to the average of monthly high and low market prices of the stock) is computed each year for ten selected electric companies that are comparable in size and location to the New Jersey company. The arithmetic mean of the middle four ratios is measured, and this arithmetic mean and similar figures for the two preceding years are averaged. The last average is multiplied by a "capital structure factor" (a special and not clearly explained factor) before the return rate for common-stock capital is computed. Finally, each of the three components is weighted according to the book capitalization of bonds, preferred stock, and common stock plus surplus. The basic rate of return is a weighted average cost of capital. And the basic total return is the basic rate of return times the basic property valuation, less 3 per cent of the stabilization reserve.

When the New Jersey Plan was put into operation, a stabilizing reserve of $975,000 (an accounting reserve rather than a segregation of assets) was created out of the company's earned surplus. This reserve, a characteristic which is borrowed from the service-at-cost franchises, is used to balance differences between the reasonable (basic) returns and

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power sales or purchases) less the average of the two lowest month-end balances in the tax-accrual and tax-reserve accounts.

* This is a complicated section of the plan that is full of special definitions and technical measurements.[29] Like the rest of the plan, the measurement of the basic rate of return reflects a strong emphasis on technicalities. This is the way to avoid misunderstandings between the company and the commission, but it also is the way to freeze the regulatory procedure.

the actual or experienced returns.* When the actual return is less than the basic return, the difference is made up by a transfer from the stabilizing reserve to earned surplus. If, on the other hand, the actual return exceeds the basic return, all the difference is credited to the stabilizing reserve as long as the reserve is less than 4½ per cent of the property valuation. If the reserve is between 4½ and 6 per cent, half of the excess is credited to the reserve and the other half goes directly into the company's surplus account. And when the reserve is 6 per cent or more of the property valuation, all excess earnings go into the surplus account and are available for dividend payments.

When the company earns more than the basic return and when the stabilizing reserve is more than 4½ per cent of the property valuation, the rates are reduced at the beginning of the next year. The company is allowed to keep the additional return above what is put in the stabilization reserve, but the amount of the extra earnings is used to measure the subsequent rate reduction.[30] Although the rates decrease as the earnings increase, they are not reduced so much that the excessive earnings are eliminated completely. An incentive is left, as the framers of the plan point out, to encourage some sales promotion by the company. If the excessive earnings (after stabilizing reserve credits) are 1 per cent of the property valuation, the commission chooses rates that are designed to eliminate only 60 per cent of the excess. And when larger excess returns are obtained, the earnings reduction is 75 per cent of the next 1 per cent of the property valuation, and 85 per cent of further additional earnings.†

Like a service-at-cost agreement that it resembles, the New Jersey Plan provides a definite cost standard of earnings control. Operating expenditures, accounting charges to depreciation expense, and capital costs measure the reasonable costs of electric service. Some costs are controlled by past expenditures; others are current expenses. The investment cost of plant, a historical measure of the property value of the company, is used to measure the depreciation charges and basic annual returns for investors. And the actual costs of debt and preferred-stock capital, which were incurred in past years, control part of the basic rate of return. Only the operating expenses and the costs of common-stock capital are measured with current facts. Just as the conventional standard of reasonable total costs contains both past and present costs, so the New Jersey Plan uses both kinds of costs. This plan regulates the total revenue with what many commissioners like to call the prudent costs of service. One difference, however, is evident: while most commissions do not have absolute measures of reasonable costs, the New Jersey Plan outlines an inflexible procedure of cost measurement. It formalizes the common regulatory standard of cost determination.

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* The experienced or actual return of any year is the operating revenue less the operating expenses, maintenance expenses, depreciation charges, taxes (including federal income taxes), and profits or losses on appliance sales.

† When the stabilizing reserve decreases below 1½ per cent of the basic property valuation, the company asks for higher rates. The calculation of rate increases, which is more complex than the sliding scale of earnings reductions, is omitted here.

The New Jersey Plan clearly accepts private production of utility services, and shows a high respect for private investors. Trying to attract new investments in market expansion and technical innovations and seeking to encourage efficient management, the plan does not take excessive returns away from the company as soon as they are obtained, but seems to give it a generous share of excessive earnings. All actual excesses in earnings belong to the company. And when rates are reduced because the experienced return is above the basic return, only part of the excess is supposed to be eliminated in the first year. Is this division of "extra" earnings large enough to induce reinvestments, or even to induce new investments in the plant? Perhaps it is. But it may not be. Like old-time guessing contests about the number of seeds in a jar or the length of a concealed piece of string, today's divisions of excessive earnings are likely to be either too large or too small to attract a certain amount of future investments. Following the common practice of most commissions, the New Jersey Commission does not try to fix a definite relationship between allowable earnings and new investments or reinvestments. It controls the earnings of the company, not the investments. Apparently the division of excessive earnings is set up to attract some unknown amount of future investments and output expansion.

Accepting the plan, the New Jersey Power & Light Company seemed to be satisfied with its bargain. The firm apparently anticipated reasonable future returns; perhaps it expected even more than reasonable amounts. Similar plans can be negotiated with other utility companies. Yet, to induce acceptance of the continuous regulatory procedures, the commissions may be forced to offer liberal terms to the firms. Hired managers and stockholders can hold out for as much as or more than they anticipate from the present, case-by-case regulation. If they do, the consumers do not obtain benefits from the formal plan of continuous earnings control that cannot be obtained from less regular, case-by-case control in a continuous manner. On the other hand, the managers and stockholders may be satisfied with more assurance of reasonable returns. They may be willing to accept reasonable measurements of operating expenses, depreciation costs, and capital costs, because the future revenues and returns seem to be more certain. Fears of confiscatory regulation diminish; and regulatory action is fixed for an indefinite time. Either the acquisitiveness or the reasonableness of utility companies is possible.

At least the plan does not control the motives of managers and stockholders.

The New Jersey Plan freezes the procedure of earnings control. Definitions of costs and price changes leave almost no area at all for regulatory judgments. An exact method of property valuation (including working capital) is specified; allowable operating expenses are itemized; depreciation costs are defined; the costs of preferred stock and debt capital are confined by technical definitions; price changes and uses of the stabilization reserve are closely circumscribed. The cost of common-stock capital, measured with several averages and other adjustments, is a special case of inflexible control. Except for the choice of comparable companies, this measurement is firmly fixed. While the basic rate of return in Washington can be changed by the commission at any time, the basic rate of return in New Jersey is measured with a fixed procedure.

The New Jersey Plan reduces regulatory justice to a formula. Earnings and price control is a clerical process; accountants and statisticians take the place of commissioners as the earnings and price levels are determined each year. Subtle problems of control, such as the changing relation between earnings and private investment decisions, cannot be handled. Future investment and production policies are uncertainties, because future demand, cost, revenue, and regulatory conditions are uncertain. Confronting these uncertainties and forced to work with incomplete information at all times, regulators never can hope to make perfect calculations of reasonable returns. Yet the New Jersey Plan, using an inflexible accounting procedure, implies an ability to make perfect, definite measurements of reasonable earnings. Even if the framers of the plan do not profess perfection, an implication of perfection still is evident in the procedure. No allowance is made for incomplete knowledge and the uncertainty of reasonableness. This plan is an achievement of administrative regulation, not an example of judicious, reflective control.

The New Jersey Plan, like the Washington Plan, does not specify how the price changes will be divided between customers. As the earnings are reduced or increased, the company and commission can assign the new prices to a single classification of customers or they can revise the prices of all electricity buyers. If a common practice is followed, the price reductions go to the buyers who are likely to increase their expenditures for service. These buyers, having an elastic demand for service, offer an opportunity for what is commonly known as "promotional" pricing. They can afford to buy appliances or to substitute electricity for other sources of fuel or power. On the contrary, the price increases are charged to buyers who have an inelastic demand for service—who are willing to increase their expenditures as the prices increase. Differentiated in this manner, the price revisions are examples of the discriminatory pricing that is described in later chapters. Perhaps the commission, recognizing the general consumer interest in price reductions and the general abhorrence of price increases, does not follow a strictly discriminatory pattern of price changes. Yet the New Jersey Plan is not designed to narrow price differentials. The price structure is not the point of regulatory focus.

Nothing is said about experimental pricing. The plan does not contain an arrangement by which price changes and new services can be tested for demand behavior and revenue effects. Losses from experimental pricing are not listed among the reasonable operating costs; nor are they specifically excluded. Perhaps the New Jersey Commission condones experimental tests of prices. In this case the company, taking the initiative, can afford to try out new prices and services now and then. If the trials are unsuccessful, the company counts these special losses among the reasonable costs. Wishing to broaden the scope of earnings control and desiring something more than a routine of regulation, the commission can amend the plan so that price experimentation is definitely encouraged.

The New Jersey Plan starts with a handicap: consumers expect price reductions rather than higher prices. Consequently the real test of this or any sliding-scale plan is likely to come during a depression. Much depends on the behavior of electricity demand as general business activity contracts. The demand for electricity may continue to increase during the depression as it did during the thirties. If so, the plan works well. Yet the electric industry must mature sometime, even if many persons still see opportunities for its expansion. If the electric companies are mature or nearly mature enterprises at the time of the next depression, the demand for their service is likely to decrease. When the demand decreases sharply, the experienced return can decline enough to press the stabilizing reserve below 1½ per cent of the basic property valuation. Then the plan grants price increases to the company. And when electricity prices increase as other commodity prices are decreasing, consumers object and the plan is open to political attacks.

A PLACE FOR CONTINUOUS CONTROL

An integration of past and known earnings with future and uncertain earnings can be used to improve the efficiency of commission regulation. Given a broad scope of operation, continuous earnings control compensates for mistaken estimates of future cost and demand behavior, allows recalculation of reasonable investor returns when experiences reveal deficiencies or excesses, provides a workable means of uniting fair-return control with reinvestments and new investments in public utility plants, facilitates experiments with new markets and new prices, and increases the frequency of earnings investigations of each company. Current American experiences with this regulatory means are confined, however, to the Washington and New Jersey Plans that affect so far only three companies, that work essentially with inflexible accounting formulas and seem to be designed to get primarily periodic investigations and more convenient regulation without discouraging aggressive private management. A complex and fixed accounting formula is not necessary for continuous earnings control. If this procedure is adapted, indeed, to the flexibility of case-by-case regulation, commissions are more likely to concentrate attention on the uncertain and changing conditions of fair-return measurements, on the relationship between earnings regulation and investments, on the long-run consequences of commission action rather than simply the immediate forms of public control. In this way the fair-return decisions, each of which is perforce a current judgment based on incomplete facts, can be associated intimately with the heavy fixed investments, durable plant, and cautious management of public utility firms while, at the same time, the consumer interest in high-quality and low-priced service is safeguarded.

Chapter 19

Cyclical Control of Earnings

THE DEPRESSION of the thirties, the greatest business collapse in the history of the nation, led to a general revision of economic thinking, forced changes in public policies, and threatened the capitalistic-democratic life of the country. Capitalists "lost face"; economists gave up a great deal of their neoclassical, mechanistic, and competitive thinking; employment of men and other resources became a primary objective of government action. Since private business showed less promise of expansion than it had in the nineteenth century, economists said that in the future prosperity periods would be shorter and depressions longer than they had been. They foresaw a tendency toward chronic depression. Investment opportunities were not so plentiful as they once were. Much industrial expansion was achieved; the best natural resources already were exploited by private investors; and further outlets for new investments were lost when immigration was restricted and population growth began to taper off. The idea of full employment (whatever that is) was considered an attractive but not a clearly realistic objective. In economic thinking the study of dynamic problems began to replace static analysis; an understanding of economic disorder drew the attention of men who once constructed and played with orderly but imaginary economic systems.

FLEXIBILITY OF PRICES

Seeking an explanation of the great depression, economists refurbished old business-cycle theories, re-examined dynamic economic facts, and wrote numerous descriptions of the cyclical behavior of a capitalistic system. No concept of the cycle was universally accepted. That was too much to expect from economists who retained their individuality, even if individualistic business seemed less attractive to many of them after 1929. Among English-speaking economists much attention was given to private and public investments as the main determinants of cyclical changes. The important facts were the revenue, cost, and earnings expectations of private and public investors. If these expectations collapsed as they did in 1929, then employment and payrolls declined and the country was plunged into a depression. Economists examined the relationship of saving and investment, though they could not agree on the exact meaning of the terms. And to make up for the investment collapse, they strongly recommended (as they still do) a federal government program of public spending.

"Administered" Prices. While they often emphasized the rate of reinvestments and new investments, economists did not neglect other inflationary or deflationary forces. One of these was the balance of prices, the equilibrated movement of prices. Here the studies and thinking were focused on "sticky," inflexible, or insensitive prices. Two measures of price flexibility or price sensitivity were common: one was the amplitude of price change, usually the percentage change from a prosperity period to a depression period; the other was the frequency of price changes, the number of times the price of each commodity changed during, say, a year. Some prices decreased sharply and changed frequently between the twenties and thirties; others changed slightly and infrequently or not at all.[1] Economists liked to contrast agricultural prices with industrial prices. Between 1929 and 1933 the price of agricultural implements, for example, decreased only 15 per cent while their production dropped 80 per cent, whereas agricultural prices declined 63 per cent and the production of agricultural commodities decreased only 6 per cent. When the causes of inflexible prices were listed, the explanations ranged from the nature of the products, demand elasticity, and customs to price leadership, collusion, and trade-association practices.[2] Some of the rigid prices were "administered" prices; they were determined in the business offices of large corporations rather than the markets. To avoid spoilation of their markets and to keep "order" among a few rival companies, these corporations preferred stable prices to stable output and stable employment.

At first a strong, affirmative case was made against price inflexibility; then, as detailed statistical studies were made and disputes arose, economists were less sure of the history and cyclical effects of inflexible prices. Within three or four years a simple discussion grew into a complex analysis of price statistics. In 1935 Gardiner Means, whose largely apriori conclusions started off the discussion, thought that price inflexibility was becoming more common, that concentrated corporate control in many industries was the basic reason for inflexible prices, and that price inflexibility was deflationary and accentuated the business collapse.[3] A few economists observed the facts of some inflexible commodity prices and questioned the proposition of an increasing price inflexibility. These dissenters gathered statistical evidence to show that prices were no more inflexible in the thirties than in previous decades.[4] Others questioned the importance of corporate concentration as a cause of inflexible prices. In some industries all or most of the output was controlled by several firms; prices were administered and often stabilized by businessmen; and sometimes prices were maintained despite great decreases in demand. But, while these facts were undeniable, cases were presented to show that prices were stable, too, in some "competitive" industries. One of the studies of the Temporary National Economic Committee seemed to show, in fact, that the concentrated control of production was not an important reason for price inflexibility.[5]

The deflationary (or inflationary) effects of inflexible prices were not always obvious or easy to measure. If inflexible prices were reduced, production and employment did not necessarily increase in the inflexible-price industries or in any other industries. Not only the prices but also the production costs were inflexible in many industries; the stability of prices was explained in part, some persons thought, by fixed costs of production, including the rigidity of union wage rates.[6] As a more important fact, the increase in production and employment depended, obviously, on the buyers' responses to price reductions. When buyers were able to postpone purchases as in cases of automobiles and other durable commodities, moderate price reductions had little effect on sales. The great decrease of agricultural-implement purchases, for example, probably was determined more by the farm income collapse than by inflexible implement prices. If the manufacturers of agricultural implements wanted to maintain production, they had to cut prices drastically. Perhaps such price reductions created a deficit condition, or even reduced the revenue of the implement companies below the variable costs of labor and raw materials. If so, the companies believed that they could not afford a flexible price policy in the face of a low farm income.

Unless price reductions were integrated in successive stages of production and distribution, a price reduction in an early stage probably had no effect on production and employment. Unless automobile companies and other users of steel reduced the prices of their commodities, a reduction of steel prices was not likely to increase the production of steel or steel-using products. Similarly, complementary use of commodities affected the relationship of prices and production. A reduction of cement prices alone, for instance, did not promise an increase in building construction; building costs in general had to decrease, or the demand for new buildings had to increase before employment could increase in the construction industry. Indeed, price inflexibility was part of a larger problem: the relationship of all prices, and the relationship of prices, consumer demands, and investments. At any rate the general cyclical effects of price inflexibility, which usually were treated as secondary and short-run cyclical factors,[7] often were lost in a maze of dynamic economic action.

Public Utility Prices. Students of price flexibility concentrated their attention on nonutility prices, particularly the prices that were administered by business firms, trade associations, and informal pricing agreements. They wanted to contrast the effects of market-determined prices and managed prices; they wanted to show that in a democratic society competition still was a good regulator of nearly all prices. But economists did not overlook the inflexibility of utility prices. They accepted the exclusive market principle of utility operations; they recognized the peculiar judicial standards of earnings and price control; and they were willing to set utility companies apart from other companies. Yet the distinctiveness of utility price determination did not gainsay the fact that utility prices were inflexible. These prices were notably insensitive to depression changes in demand and buyer incomes, even more so than many managed prices of nonutility commodities. Like other insensitive prices, utility prices did not change in proportion to general price changes and did not decrease or increase in proportion to the national income changes.

Most prices of "local" utility services did not respond to the income and employment collapse between 1929 and 1933.[8] Manufactured gas and telephone rates did not change much between the twenties and the thirties; in 1936 they were about the same as in 1926. As natural gas lines were extended to Southern, Midwestern, and Western cities during the thirties, gas companies voluntarily reduced their prices; but these price changes for natural gas service were a result of technical innovations instead of demand decreases. And water rates probably were as inflexible as any other utility prices. Starting to increase as the demand for service decreased during the twenties, street railway fares continued to increase between 1929 and 1933. But electricity prices, both for residential and industrial buyers, decreased after 1929. The average residential price for 25 kilowatt-hours decreased 13 per cent between 1929 and 1936; and the average residential price for 100 kilowatt-hours decreased about 19 per cent during the same period.[9] These changes in electric rates were not a response to lower family incomes; they were a result, for the most part, of more aggressive regulation that belatedly reduced the excessive earnings of electric companies. Perhaps electric prices, like other utility prices, will become more rigid as the industry matures, as the demand growth tapers off and technical innovations appear less frequently.

Reasons for Rigid Prices. The pattern of reasonable-earnings regulation explains much of the inflexibility of utility prices. This regulation is supposed to give each individual company a reasonable amount of earnings. Even if the demand decreases or the total costs increase so that a company cannot obtain reasonable earnings at any price, the commissions are expected to fix prices that minimize the deficits. The decision of the Supreme Court in the Hope Natural Gas case made a notable change in reasonable-earnings regulation: it centered judicial review on the results rather than the methods of reasonable-earnings control, and left the regulatory procedures to the commissions. It set aside the property valuation controversy, particularly the measurement of fair property values and "consideration" of reproduction-cost valuations of property. But it did not repudiate the standard of reasonable earnings.

Now, as in the past, commissions must be attentive to the property rights of utility companies, avoiding confiscation of private property and preserving the attractiveness of investments. The reasonable-earnings standard is an individualistic standard of regulation, designed to protect the private management and private property of individual companies. And it is unrelated to the social welfare of the nation; utility prices are not related to employment and commodity production throughout the nation. The reasonableness of utility earnings and prices is determined by private investment conditions, not by general economic conditions.

The reasonable-earnings standard not only is an individualistic, but also a static standard.[10] This standard is used at all times; it does not change with dynamic economic conditions. A company is entitled to a reasonable return in bad times as well as prosperous periods; it is entitled to a reasonable return each year. Some utility firms even ask for price increases after a depression sets in; experiencing greater demand decreases than cost decreases, they want price increases so that their fixed costs can be covered and their dividends can be paid. The reasonable return is a sort of "normal" return, a return that is large enough to maintain a certain amount of service during a long time period. Yet, even though this norm of reasonable earnings is based on long-period conditions, it is used to measure the reasonable earnings in an immediate investigation. A long-period, normal standard is used to make short-period measurements of earnings. No Supreme Court decision definitely approves a long-period regulatory policy; no decision provides for more than reasonable earnings in good years and less than reasonable earnings in depressed times.

Controlled by the present pattern of earnings regulation, the flexibility of utility prices depends on the flexibility of the real expenditures and imputed service costs. (The fair-return and regulated-depreciation charges make up most of the imputed costs.) These expenditures and imputed costs do not rise and fall freely with other prices, and with changes in consumer demand. The wage rates of utility-company employees are quite stable throughout business cycles. Part of the wage-rate insensitivity can be explained by union wage policies; labor unions commonly want to hold their gains in collective bargaining. Some inflexibility of wage rates can be explained, too, by managerial policies, particularly the contribution that well-paid, satisfied employees can make to public and consumer relations. The rates of utility-company taxation do not decrease sharply during business collapses or increase substantially during good times. When business deflation is severe, utility companies often are singled out, in fact, for special sales taxes and heavier property taxation.

Charges for property depreciation are approximately the same during a prosperity period as in depressed times.* Using a straight-line method of depreciation accounting, most commissions require companies to make uniform or nearly uniform depreciation charges from year to year. And if the reasonable return is based on an original-cost valuation of property, it does not change from year to year unless the rate of return is raised or lowered. Commissions do reduce and increase the rate of return with the decline and rise of interest rates; even so, the earnings and price changes lag behind general price changes and often are small.†

The managers of utility companies do not want flexible prices. At least they are unwilling to make general price reductions as the buyers' demands decrease. They apparently believe that most buyers have a price inelasticity of demand. If so, a general price reduction results in a loss of total revenue and net returns. And they must reckon, too, with the fact that commissions approve voluntary price reductions, but often resist company petitions for higher prices.‡ When price reductions turn out badly and the firm wants to restore its old prices, the commission not only can refuse to make up the earnings loss, but also can subject the company to a general investigation before the old prices are restored. Companies are compelled to view their voluntary price reductions as permanent rather than temporary changes. But, in spite of the downward bias of utility prices, companies often respond to sharp decreases in demand. They offer price reductions to buyers who seem to be willing to increase their expenditures on utility services. And they search for new uses of utility services. As a general rule, they make some price adjustments to cyclical conditions; but they do not adopt a truly flexible price policy, trying to maintain sales and production in the face of demand decreases.

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* Regulation of depreciation charges is described in Chap. 15, and the fair rate of return is discussed in Chap. 17.

† If the returns are based on reproduction-cost valuation, they have more cyclical variation than if they are based on original-cost valuations. The original cost of property is fixed, but construction costs increase and decrease somewhat with general price changes. Yet, even though the collapse is severe or the boom is strong, the costs of reconstructing utility plants are quite inflexible. Between 1929 and 1932 the construction costs of utility plants declined between 10 and 20 per cent in most industries.[11] And by 1937 most of these construction costs were as high as they were before the depression.

‡ Elasticity of demand is discussed mainly in Chaps. 2 and 26, and managerial use of voluntary price reductions is described in Chap. 25.

Finally, the utility commissioners apparently do not desire a flexible price policy. If the Supreme Court ever returns to the decision of the Munn case and relinquishes judicial review of utility price regulation, commissioners probably will not choose a cyclical pattern of earnings and price regulation. Being administrators, they often are so interested in the completion of regulatory tasks that they do not think much about the purposes of regulation. They want clean desks, a smooth flow of decisions, and quiet lives instead of puzzling problems about the general economic effects of utility prices. They like factual controls of earnings and prices, choosing accounting information rather than general economic reasoning as the basis of their decisions. Indeed, they have a tough resistance to the ideas of experts. Commissioners usually are untrained in economic thinking. Nor do they like the generalities and complexities of economic thought; they seem to distrust economic thinking even more than they distrust the reasoning of most experts.

Commission Reactions to Depressions. Restrained by Supreme Court opinions, by administrative considerations, and by what Veblen called "trained incapacity," commissions never have related earnings and prices to the system-wide employment of resources.[12] Even when the great business collapse occurred between 1929 and 1932, they retained the rule of a fair return on some property value. But as the depression deepened and prices tumbled and unemployment increased after 1929, many commissions became more aggressive regulators. More investigations were ordered. More attention was given to the determination of service costs, to the determination of operating costs as well as fair returns. Property valuations were pressed down as commissions either demanded less imaginative reproduction valuations or gave more attention to original-cost valuations. Fair rates of return were reduced, and some commissions devised ways to expedite rate investigations and hearings and at the same time to avoid the dangers of court litigation.[13]

The aggressive regulation of the thirties was effective: it produced many price reductions. Regulation was tightened, and excessive earnings were squeezed out of many companies. But it was not a cyclical pattern of regulation. It was the old pattern of reasonable-earnings control; the companies' returns still were based on property values, though the commissions were more careful as they measured the reasonable service costs. Commissions did not try to synchronize utility prices with nonutility prices, lowering utility prices and returns during the depression years and planning to increase them during the forthcoming prosperity period.

Instead, they wanted permanent price reductions. Perhaps the general regulatory view was expressed by the Missouri Commission, when it said,

> We do not understand that rates to be charged by utilities should be made as flexible and changeable as the price fluctuations of some classes of commodities and, therefore, unless conditions indicate that a decrease in revenue and an increase in operating expenses are reasonably permanent, rates should not be corrected.[14]

Occasionally the commissions broke away from the traditional cost pattern of earnings regulation and considered the great decline in many buyers' incomes. One commission proposed, for instance, that during bad times the utility companies should receive only enough earnings to avoid insolvency;[15] others gave more attention to the value of service as a standard of earnings regulation. This was a way to take account of demand and income changes, because the value of service could be objectively defined as the demand for service. Several commissions apparently reduced utility prices because the buyers had large income reductions.[16] In several states the regulators recognized the great financial distress of farmers and singled them out for special price reductions.[17] During the serious Midwestern drought of 1934 the Wisconsin Commission, for instance, ordered emergency reductions of rural electric rates.[18]

In the Wisconsin telephone investigation, which began with a temporary rate order in 1932 and ended with a final rate order in 1937, the Wisconsin Commission gave more attention to dynamic economic functioning than any other state commission ever did.[19] At first the commission seemed to be moving toward a cyclical pricing policy.[20] Decreases in pay rolls, employment, manufacturers' net returns, farm incomes—these and many other facts of the economic collapse were described. At the same time the commission observed that many utility companies had stable prices and incurred only moderate revenue and dividend reductions. A number of economists described the depression, and discussed the inflexibility of utility prices. But when the Wisconsin Commission decided the case, it clung to the old regulatory form and did not formulate a cyclical pattern of price and fair-return control. It found two reasons for telephone rate reductions: the reduction of business returns everywhere, and the decreases in buyer incomes that reduced the value of telephone service. This dynamic regulatory effort, for which the Wisconsin Commission spent about $2,000,000 during an eight-year period, was in vain. In 1939 the Wisconsin Supreme Court, guided by conservative reasoning, decided that the telephone rate reductions were unreasonable.[21]

EFFECTS OF INFLEXIBLE PRICES

Utility services occupy an important place in the total business activity of the country. According to Kuznet's figures, utility services (including Pullman, express, oil-pipe-line, and railroad services as well as other utility services) accounted for approximately 10 per cent of the national income between 1919 and 1938.[22] But the national importance of utility services does not explain the relationship of utility and nonutility business, or the relationship of utility prices and income flows. When utility prices are reduced, consumers can buy the same quantity of utility service for a smaller total expenditure. They have more money to spend on both utility and nonutility commodities. Likewise, when utility prices are stable, utility companies have more revenue to expend (assuming a price inelasticity of demand) than if prices are reduced. Are the companies willing to spend as much of this difference as is spent by consumers? If the consumers spend more freely than the companies do, then a stable price policy is deflationary.

A comparison of the expenditure habits of utility companies and utility consumers is an important factor of a cyclical pricing program. But the analysis of income flows should be carried further. It should be extended to successive "stages" of expenditures. When utility prices are reduced and utility consumers spend more on nonutility commodities, the sellers of nonutility goods and services obviously have more money to spend. The income effects of the price reductions depend, in part, on what these nonutility sellers do with the increases in their revenues. They depend, too, on what happens in still later stages of expenditure changes, though the income effect becomes widely diffused and difficult to trace in these later stages.

The student of a cyclical pricing program must examine the income effects of utility-company expenditures; he must study the spending habits of persons and companies who receive the expenditures. These habits vary widely: utility-company employees probably spend their pay checks in much the same way that utility consumers spend their incomes; equipment manufacturers and raw material suppliers usually spend more cautiously than employees; and security holders often are among our most conservative spenders. If economists know what persons and companies do with each addition to their incomes, they can tell how much the instability of business is aggravated by inflexible utility prices. But they do not have complete knowledge of all spending habits. They must work with crude or scanty data, make rough comparisons, and think in terms of a few "stages" of successive expenditures rather than the complete, integrated flows of income.

Financial Conditions. A cyclical pricing program cannot be realized unless the payment (or provision for payment) of some service costs can be shifted from the depression period to the prosperity period. Payment of some service costs cannot be deferred. Funds must be available for current operating expenditures such as the payment of wages and the purchases of materials. Similarly, a company must pay the interest on bonds and notes when it is due. And if a firm wants to avoid impairment of its credit, it treats preferred dividends, too, as current obligations. But two kinds of service costs—the dividends on common stocks and depreciation charges—can be wholly or partly deferred from the depression phase to the prosperity phase of a cycle. These costs are an important part of total utility costs, because the companies use large amounts of capital. Between 1919 and 1938 a sizable amount of utility-company revenue was distributed to stockholders; dividend payments to preferred and common stockholders were 31.4 per cent of electric company net revenue, 32.0 per cent of manufactured gas net revenue, and 19.7 per cent of telephone net revenue.[23] The annual depreciation charges were large also. The depreciation charges of electric firms, for instance, were slightly more than 10 per cent of total revenue between 1938 and 1945.[24]

Expenditures of utility companies are not uniform throughout the operating periods of a business cycle. This is a special condition of the cyclical pricing problem: some companies can build up their cash holdings and other liquid assets during the contraction and depression phases of a cycle. Favored by demand conditions which are described in the next section, some utility firms incur only small decreases in total revenue during a business slump. But they do reduce their expenditures on labor, raw materials, and plant replacements faster than the commissions reduce rates. So, while the total revenue remains quite stable, a reduction of expenditures leads to an enlargement of cash and other liquid assets. Between 1930 and 1931 the cash holdings of electric companies decreased about 15 per cent; but by 1934 the cash holdings were 75 per cent higher than in 1929.[25] Electric companies accumulated cash holdings, even though large amounts of their notes payable and unsecured loans were paid off between 1929 and 1936.* On the contrary, the cash holdings of four hundred industrial firms, the sample of the Standard Statistics Company, declined after 1929 and reached their lowest figure during the 1937 recession.[26]

The operating companies of the electric industry obviously prospered throughout the thirties. Apparently the telephone, gas, and water industries also were in a good financial condition during the great depression.

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* To the persons who always want the latest facts, these and other data from the thirties may seem out of date. Yet they are the latest until another deep depression appears.

But not all utility industries were able to build up cash holdings and liquid assets so easily as the electric firms did. Railroad companies, experiencing great decreases in demand, managed to increase these holdings about 16 per cent between 1929 and 1934; in 1936 the cash and liquid-asset holdings were about 40 per cent higher than in 1929.[27] And if the cash holdings of street railway and bus companies were measured, no more than a modest increase probably could be shown for the contraction and depression periods; like the railroad industry, the urban transportation business had financial troubles during the thirties. Avoidance of corporate insolvency is a condition of this pricing problem. Demand decreases and financial troubles limit the opportunities for a flexible price policy. Thus the telephone, gas, water, and electric industries seem to afford the best locations for a workable program.

Demand Conditions. The effects of utility prices on income flows are related, of course, to the consumer demands for utility services. Both the price elasticity and the income elasticity of demand have a bearing on the problem.* Price elasticity of demand, the common way in which the concept of demand elasticity is used, expresses the relationship between the various price and quantity dimensions of a demand curve. When buyers have a price elasticity of demand for a commodity, they are willing to increase their total expenditures as prices decrease. And when buyers have price inelasticity of demand for a commodity, they buy somewhat larger quantities as prices decrease; but their total expenditures decline. When buyers are attached to a certain commodity or when they do not have access to a substitutable commodity, the demand for the commodity usually is price-inelastic. Residential consumers and some commercial buyers have an inelastic demand for water, telephone, gas, and electric service.

Income elasticity of demand, which expresses the relation between changes in buyer incomes and buyer expenditures on a commodity, resembles but is not quite the same as price elasticity of demand. When buyers increase (or decrease) their expenditures on a commodity more rapidly than their incomes increase (or decrease), they have an income elasticity for the commodity. But when the expenditures do not change in proportion to buyer income changes, there is an income inelasticity of demand. Like price inelasticity of demand, income inelasticity of demand is a common condition of residential and much commercial utility service. Consumers are habituated to a certain amount of utility service, and are unwilling to give it up even when their incomes decline.

Domestic buyers of water, telephone, gas, and electric service seem to have both a price inelasticity and an income inelasticity of demand.

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* The meaning of price elasticity and income elasticity also is described in Chap. 2.

Unless new uses of service are developed, they do not make substantial changes in their total expenditure as the price of service decreases. Therefore, either a permanent or temporary price reduction reduces the utility-company revenue, and a price increase enlarges the company revenue. Because they have an income inelasticity of demand for most utility services, domestic buyers spend a larger and larger percentage of their incomes for utility services as their incomes decline. During the contraction phase of a cycle the sellers of electric, gas, telephone, and water service obtain an increasing fraction of family incomes. But when their incomes are increasing, smaller and smaller fractions of these are spent for utility services; most of an increase in pay rolls goes to nonutility sellers rather than utility firms.

Another consideration is the propensity to consume goods. Some families, notably those who are in the upper income brackets, do not spend up to the limits of their incomes. They save part of their incomes in both the contraction and expansion stages of a trade cycle. Indeed, they do most of the individual saving.[28] But most of the families—the domestic buyers of telephone, water, gas, and electric service—live up to the limit of their incomes. Using Keynesian language, we say that they have a high propensity to consume and a low propensity to save. If the utility prices are reduced, domestic buyers reduce their total expenditures for utility services. But they are likely to increase their expenditures on nonutility commodities and services. Many of them may transfer the whole decrease of utility expenditures to nonutility purchases. And when the utility prices increase, many families must give up nonutility commodities in order to maintain their consumption of utility services.

Like the domestic buyers, the retail stores, wholesaling establishments, professional men, and various service organizations have a price inelasticity and income inelasticity of demand for utility service. Their expenditures do not increase as the prices of utility service decline; and their utility expenditures do not change in proportion to their income changes. Indeed, when their revenues and net incomes decline, some commercial buyers, such as retail stores and hotels, may increase their lighting expenditures or install air-cooling systems and try to attract more customers. If the utility prices are reduced, commercial buyers, too, have more money to spend elsewhere. Perhaps some professional men, such as dentists, physicians, and tradesmen, do increase their equipment expenditures and family expenditures as much as their utility expenditures decline. But the managers of large retailing organizations do not have the same propensity to consume as that of individuals and families. They usually do not like to spend up to the limits of their companies' incomes. Consequently a reduction of commercial utility rates does not alleviate the instability of business, because it does not clearly increase the sale of nonutility commodities during a depression.

Industrial sales of gas, water, and electric power vary, for the most part, with industrial production. The industrial buyers probably have higher income elasticities of demand for gas, water, and electric service than domestic and commercial buyers. But they may not increase their expenditures on either utility or nonutility commodities as utility prices are reduced. When the cost of utility services is a small part of total manufacturing costs, an industrial firm is not likely to be responsive to utility price changes. If utility prices are reduced, such an industrial producer probably does not reduce his own prices; a utility price reduction is not worth a revision of the industrialist's prices. Similarly, manufacturers do not always increase their prices as soon as utility prices are increased. But when the cost of utility services constitutes a sizable part of the manufacturing costs, as it does in some electrochemical and electrometallurgical industries, the manufacturers may be responsive to utility price changes. If a substantial reduction of utility prices is offered, these manufacturers may reduce their own prices; at lower prices they can make larger sales. Yet, even when the expenditures on utility service are an important fraction of manufacturing costs, industrialists are not always responsive to utility price changes; they may choose a policy of price stabilization.

Contraction and Depression. When utility prices do not decline so much as national income decreases, utility companies obtain an increasing percentage of the total national income. This is true because utility consumers, particularly domestic buyers, have an income inelasticity of demand. Consumer expenditures on nonutility commodities must be reduced, of course, so that a larger and larger fraction of consumer income can be spent on utility services. Inflexible utility prices take revenue away from nonutility firms, and reduce employment in the nonutility industries. If utility firms maintain their expenditures, they can compensate for at least some deflationary effects from an inflexible price policy. But they do not maintain expenditures as a business contraction progresses. Experiencing some increases in unused plant capacity, they reduce their investments in plant replacements. Affected by the general deflationary temper, they are likely to economize the use of labor and raw materials. Prospering companies can reduce their expenditures more than their revenue declines; the cash holdings of these companies increase. The inflexible prices, income inelasticity of demand, and managerial expenditure policies come together to aggravate the business collapse.

Some utility companies are proud of their ability to maintain interest and dividend payments during a severe business contraction. This achievement is facilitated by an income inelasticity of demand. When many firms are passing dividend payments, utility companies often can maintain common dividend payments because their consumers give up expenditures on nonutility commodities rather than on utility services. Continuance of dividend payments is less deflationary than increases in the cash holdings of utility enterprises. But the stabilization of dividends can be deflationary too. Belonging to the comfortable, well-to-do class that does most of the individual saving, stockholders do not have the same high propensity to consume that most families have.[29] Perhaps some of them spend all their dividend checks on consumer goods and services. Yet many of them, sated or nearly sated with consumer goods, spend only parts of their incomes. Seeing no attractive investment opportunities during the business collapse, they hold part of their incomes, and idle funds accumulate in the banking system.

A temporary, cyclical reduction of some utility prices can reduce the deflationary effect of inflexible prices. When the utility consumers have higher propensities to consume than that of the utility companies or their stockholders, the flow of income increases as a result of price reductions. Domestic buyers of utility service commonly have high propensities to consume; they are anxious to satisfy their wants. A reduction of some industrial rates also is a possible way to increase expenditures on nonutility commodities, though manufacturers are not always responsive to utility price changes.*

Even though domestic rates alone are reduced, the expenditures on nonutility commodities increase more than if utility companies accumulate cash or stockholders receive their customary dividends. Yet the sales of nonutility goods and services may not increase greatly because the utility prices are flexible. If domestic utility prices are cut as much as 25 or even 50 per cent, most families have only a few more dollars to spend on nonutility commodities. Flexible utility prices cannot start a whole economic system on the way to prosperity. They contribute in a small way to the stability of business, but an enlargement of private and public investments is a necessary condition of a business recovery.

Recovery and Prosperity. When business activity begins to recover and the demands for both utility and nonutility services increase, the utility companies have outlets for cash funds. They can restore deferred plant maintenance, make necessary plant replacements, and invest earnings in new equipment and plant expansion. Certainly they do not need the same "cushion" of cash or liquid assets that some of them want during a business collapse. They can use cash funds immediately, avoiding the deflationary effects of idle funds. If utility prices and earnings are increased, the companies can use the increment in revenue for larger plant expenditures and more dividend payments. Just as a utility firm has an outlet for investable funds, so, too, the stockholders have similar outlets for larger dividend payments. Now they see investment opportunities that they did not see or did not like during the depression. Providing companies and their investors with funds when they can use funds, a flexible price policy does not hamper the expansion of utility operations.

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* If a cyclical pricing policy is extended to industrial service, regulators must differentiate between the buyers who do not reduce (or increase) their own prices as utility prices decrease (or increase). This is difficult to do. The responsiveness of industrial buyers cannot be accurately anticipated. Perhaps the price reductions can be offered to the industrialists who agree to reduce their own prices. But most commissions do not have enough staff members for widespread negotiations of industrial price changes.

Domestic consumers are bound to be irritated by cyclical increases of utility prices. They understand their own employment and expenditures, but they do not comprehend the functioning of the economic system. If the political problem of irritated consumers is set aside, the main question is the effect of higher utility prices on income flows. When prices are increased, buyers obviously have less income to spend on nonutility goods and services. Some families are ready to spend an income increment as soon as they get it. Others take time to adjust their spending habits to larger incomes; their marginal propensity is smaller than their average propensity to consume.[30] The increases in utility prices may be deflationary, restricting production, employment, and income expansion. At any rate, the prosperity effect of a flexible price policy depends on the willingness with which utility companies and their stockholders spend increments in income. Like most income movements in our economic system, these expenditures cannot be closely traced and accurately measured.

PLANS FOR CYCLICAL PRICING

A dynamic pattern of earnings and price and control seems to need three general characteristics. First, as the economic system alternates between prosperity and depression, utility prices and utility-company earnings should alternate in the same directions. Designed to improve business stability or at least to avoid an aggravation of business instability, a cyclical pattern of pricing gives the companies less than reasonable returns during bad times and more than reasonable returns in good times.[31] Second, the cyclical variation of prices and earnings should not give the firms less than reasonable returns during a whole business cycle. Even if the returns in some years are less than fair, the aggregate return over a period of years should be large enough to maintain the credit standing and operating efficiency of companies. Third, the plan should take account of consumer reactions to fluctuating prices, commissioners' ability to understand economic matters, and managerial considerations such as the administrative costs of price changes. It should be a sensible, workable plan of price control.

The Cash-outlay Plan. One method of dynamic price control, which can be called the "cash-outlay" method, treats the measurement of the reasonable return as a long-period problem. A commission still allows a utility company a reasonable return—a return that supports the credit of the private firm and maintains the production of service. Just as the present form of earnings regulation provides a reasonable return for utility companies, so the cash-outlay method is used so that the earnings expectations of managers and investors are respected. If they make wise investments and the demand for service does not decline, firms can anticipate enough earnings to pay interest and preferred-dividend obligations and to provide reasonable returns for common stockholders. But, unlike the present regulations, the cash-outlay method does not allow a reasonable return every year. During a business collapse the regulated return is less than a reasonable return; in the expansion phase of a business cycle it is more than a reasonable return; and during a whole trade cycle the separate annual returns are supposed to add up to a reasonable return.

If the cash-outlay method is used, the annual, semiannual, or even quarterly earnings of companies are controlled by the "necessary" expenditures of each firm. While a reasonable return is the ultimate, long-period aim of regulators, the cash needs of companies determine the short-period returns. Trying to minimize the deflationary effects of utility prices and idle cash funds, commissions roughly equate the cash revenue of an operating period to the anticipated cash expenditures of the period. The short-period flow of funds toward the firms is regulated according to the flow of funds away from them. These companies receive enough revenue to meet necessary expenditures for labor, raw materials, repairs, and planned plant replacements. To avoid credit impairments or receiverships, the commission and the company count interest and preferred-dividend obligations among the necessary expenditures. But a uniform rate of common-stock dividends is not essential to the financial success of a firm. Nor does a company need to recover the depreciation cost as the depreciation charges are made; the recovery of depreciation charges can be deferred from one cycle period to another.

The cash-outlay method divides the long-period reasonable return among short operating periods so that the flow of income toward utility companies is integrated with the expenditures of the firms. But no company or commission can achieve a perfect integration of revenue and expenditure flows. Regulators can only try to maintain a relationship from operating period to operating period between cash revenues and cash expenditures. If they do this, they need more accounting control of utility companies. Prices of service are fixed before expenditures are known; prices and revenue anticipations must be related to forthcoming expenditures. Consequently the dynamic control of earnings and prices is based on budgetary information. Commissions prescribe budget forms, and require firms to submit budgetary information about expected revenues and contemplated expenditures. These budgets are prepared and submitted every year, every six months, or even every three months; they are prepared at least as often as the commission considers price revisions.

If a perfect relationship is maintained between revenue and expenditure flows, prices are changed every time the revenue of a company is less or more than its anticipated expenditures. This is impossible. If commissioners base their price decisions on facts, they cannot change prices as often as the market prices of eggs, fresh green beans, or wheat change. They cannot alter the prices more frequently than they can accumulate information about revenue and expenditure changes. They can vary prices only as frequently as they see demand changes or revisions of expenditure plans—only as frequently as budgets can be sensibly assembled. Attention must be given, furthermore, to the administrative costs of frequent price changes. And the reactions of buyers to weekly or even monthly price changes must be considered. When nonutility prices are decreasing rapidly and unemployment is increasing sharply or when the economic system is moving quickly toward prosperity, the prices can be changed, say, every six months or even every three months. Otherwise the commissions may not change prices more often than once every year. Avoiding frequent price changes for practical reasons, commissions also do not closely adapt a flexible price policy to short business cycles that do not last more than three years. They focus regulatory attention on the long and more accentuated cyclical changes such as the generally prosperous twenties and the deeply depressed thirties.

Next, the commissions must choose the buyers to whom the flexible price program is applied. This point is discussed in the preceding section. If price reductions are made in accordance with buyers' propensities to consume, the domestic consumers of water, telephone, gas, and electric service are the best choices.* Most domestic buyers spend all their incomes quickly. When a price reduction allows a reduction of family expenditures for utility services, the families can spend more on nonutility commodities. Some commercial buyers, particularly the professional men and tradesmen, also have high propensities to consume. But unless the commissions are able to differentiate between consumers, commercial buyers are poor choices, because large stores, hotels, and other corporate organizations are not likely to change either their prices or their nonutility expenditures when the utility prices change. If industrial customers are willing to change their own prices and increase their expenditures as utility prices are revised, they afford good locations for flexible prices. But many of them want stable rather than flexible prices for their own products. Again domestic service seems to be the best choice for the price changes.

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* Some families are in the well-to-do classes, and have a higher propensity to save than most families. If a commission wants to concentrate price reductions in the lower income classes, it can reduce the first "block" prices of gas, electric, and water service and the two-party and four-party telephone rates.

When a commission uses the cash-outlay method of dynamic earnings control, the past earnings are a factor in current earnings and price regulation. A choice can be made between two procedures: companies can be allowed more than reasonable returns in good times so that prices can be reduced in bad times, or prices can be reduced during depressions and the deficient earnings can be restored during prosperity. When either procedure is used, the earnings of past operating periods obviously are considered in future earnings regulation because a company is not expected to obtain more than a reasonable return in the long period. Companies cannot treat past earnings as their private, untouchable property; commissions cannot ignore past deficits. Dynamic earnings control requires continuous earnings control; it requires a relationship between past and planned earnings. It requires the kind of hindsighted and foresighted regulation that is described in Chapter 18.

The cash-outlay method depends on the measurement of "necessary" short-period costs of service. If a company expects to continue operations, some expenditures must be made from day to day or from year to year. Payments for labor, raw materials, and some minimum of plant maintenance are unavoidable. Likewise, interest payments and even preferred dividends are necessary, though bondholders and preferred stockholders often do not have high propensities to consume. A reduction of domestic consumer prices is probably more effective than interest payments and preferred dividends in increasing the sale of nonutility commodities. But a commission must treat interest payments and preferred dividends as necessary expenditures; a firm cannot avoid a receivership unless it pays the bond- and noteholders, and unpaid preferred dividends can disturb the credit standing of a utility company. The commission, nevertheless, can vary the cash outlay for common-stock dividends, reducing the dividends during a depression and increasing them in prosperous times.

Perhaps the common dividends should never be eliminated entirely in any year, even if the commission promises to make up depression-time deficiencies at a later time. Yet the common dividends of utility companies need not be higher during a depression than the common dividends of nonutility firms.

A uniform rate of common dividends is not a necessary expenditure from year to year. Neither is it necessary for utility companies to "earn" or recover their depreciation charges each year. Using a full-reserve method of depreciation accounting, the companies can make regular annual charges to depreciation expense. But the cash revenue need not be so high each year that the companies recover the full depreciation cost each year. In depression years the prices and revenue can be reduced, leaving the companies without enough revenue to cover depreciation charges; in prosperous times the prices and revenue are increased, giving the firms enough revenue to cover current depreciation charges and to make up the unearned depreciation of preceding years. Prospering companies recover their investments as fast as they need funds for replacements, plant repairs, and repayments of indebtedness.

When the recovery of depreciation charges is controlled from year to year by planned expenditures on plant replacements and repairs, the cash-outlay method is at odds with the traditional principles of depreciation accounting.* If the conventional thinking of accountants is followed, depreciation charges account for the current consumption of past investments. Depreciation accounting is not supposed to provide for plant replacements; accountants record the depreciation expense, and leave the uses of recovered depreciation charges (cash revenue) to the managers. The cash-outlay method of dynamic earnings control does not turn depreciation accounting into a form of retirement accounting; it does not make plant replacements the purpose of depreciation accounting. But it does tie up the recovery of depreciation charges with the planned replacement expenditures. Altering the financial effects of traditional depreciation accounting, the cash-outlay method allows companies to recover depreciation only as fast as they need cash.

The limit of utility price flexibility is determined, for the most part, by the variation of common-stock dividends and recovered depreciation charges. This variation is not large for utility companies. From 1938 to 1945 the common-stock dividends of electric firms ranged from 12.1 per cent to 8.7 per cent of operating revenue.[32] During the same period the depreciation and amortization charges of electric companies were slightly more than 10 per cent of operating revenue. Allowing for some common dividends in depression years, commissions can put electric earnings about 15 per cent above or below a reasonable level. If all electricity prices are made flexible, a 15 per cent variation above or below reasonable prices does not represent much price flexibility. But when domestic prices alone are flexible, the effect is larger. Concentrated among the domestic consumers, the price reductions of some electric companies can be pressed 25 per cent or more below the reasonable electricity prices.

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* It is at odds, too, with the sinking-fund requirements of many bond indentures that are designed to protect the investment values of lenders rather than to preserve some stability of economic life.

The cash-outlay plan seems to meet one test of dynamic earnings regulation: it does not aggravate the instability of business. Designed to synchronize the flow of funds to and from utility companies, it minimizes the deflationary effect of utility prices. But it is not yet an acceptable method of earnings control. Bound to the conventional earnings regulation and anxious to simplify regulatory processes, commissions are not likely to accept the cash-outlay method. Most of them are not even interested in the problem of dynamic earnings regulation. The Supreme Court does not explicitly approve regulation, moreover, that gives companies less than reasonable returns in some years and more than reasonable returns in other years, that treats the measurement of reasonable returns as a long-period problem rather than a current problem.

The Reserve Method. Another plan of cyclical price control, which involves the accumulation of an earnings reserve during good times, is similar to the cash-outlay method. During a prosperity period the utility companies are allowed more than reasonable earnings. The excesses are put in an earmarked fund which can be called the "earnings reserve fund." This fund is held either in cash or in liquid assets such as the notes and bonds of governments and business corporations. When a business collapse begins, the utility prices are reduced. To cover the depression-time deficiencies in their earnings, the companies draw on the earnings reserve fund; this fund can be used to pay interest and dividends, to repay noteholders and bondholders, and to finance plant investments. And when prosperity returns, the utility prices are increased and the fund is built up again.

Like the cash-outlay method, the reserve method treats the measurement of the reasonable return as a long-period problem. And the excessive earnings of the prosperity period are not the property of the companies; they are simply entrusted to the firms. The reserve funds are controlled by the commissions rather than the companies and are used for future price reductions. And price changes can be restricted chiefly or altogether to domestic buyers, because they have a high propensity to consume. Prices are not changed every day, week, or month. When economic activity is changing sharply and frequently during the contraction or expansion phases of a business cycle, a price change every three or six months is desirable; otherwise prices are not changed more often than once a year.

There are several differences between the reserve-fund and cash-outlay methods. The cash-outlay method is designed to integrate the cash flows to and from utility companies; the reserve method is directed toward accumulation of a cash fund and other liquid assets. Next, the cash-outlay method can be started either during a prosperity period or during a depression. But the reserve plan must be started during good times; a fund must be built up before prices can be reduced below a reasonable level. Third, the reserve method allows a wider cyclical variation of utility prices than is possible in the cash-outlay method. While the cash-outlay method depends chiefly on the deferment of some common dividends and depreciation costs, the reserve method builds up a fund so that interest, preferred dividends, and common dividends can be paid out of it during a depression. The fluctuation of prices under the reserve method depends on the size of the fund rather than the amount of necessary expenditures.

The reserve method can have deflationary effects as the earnings reserve fund is built up. Cash revenue is earmarked and set aside in this special fund. This revenue is obtained largely or altogether from domestic consumers who usually are willing to spend freely. Perhaps some of the cash in the earnings reserve fund is used to buy securities. But part of the fund is likely to be idle cash. If the income of many families is turned into an inactive cash fund, the reserve method is deflationary. Deflationary effects during good times are traded, in a sense, for inflationary effects during depressed times.

The reserve method may be more attractive than the cash-outlay method to commissioners. Regulation of short-period revenue according to planned expenditures probably is too indefinite, too complicated for most commissioners. Accumulation of an earnings reserve fund is understandable and definite. But the commissions are not likely to adopt the reserve method. Like the man who does not repair his roof on a sunny day, the commissions do not think of a reserve fund until a severe depression sets in—until it is too late to accumulate a fund. The legal status of the reserve method, moreover, is not yet clear. If the Supreme Court treats the earnings reserve funds as the property of utility companies, the method cannot be used.

The Marginal-cost Method. Cyclical flexibility of utility prices can be realized with a third procedure. This method calls for an equation of prices and the marginal costs of production. If the marginal-cost method ever is used, the requirement of a reasonable return is set aside;

companies are not assured a reasonable rate of return on some property valuation either in the short period or the long period of operations. Rather, the return is determined by the relationship of the buyer demand to the marginal production costs. This method is described in the next chapter.

Chapter 20

A Proposal: Marginal-cost Pricing

THIS CHAPTER deals with an idea of price control that resembles the cost-price relationship in a competitive market. The idea is an equation of any public utility price and marginal cost (the additional cost of additional output) that is incurred to extend production to its present limit, not an equation of the price and the average reasonable cost of each utility service. Marginal cost is an important factor in competitive pricing. Under pure competition a single seller competes with numerous other sellers who sell the same product in the same market; a single seller does not have any perceptible influence on the market price. Lacking personal control of market conditions, an individual seller takes the market price for granted and makes the best possible adjustment to it. He wishes to increase his production until the marginal cost of additional output equals or nearly equals the market price that he can obtain for each additional sale; this is the limit of maximum profits for a single seller. Producing less than this output, the seller can obtain a larger return from more production because the additional cost of more service is less than the revenue increment from additional sales. Seeing the same opportunities for more profits, many of the competing sellers can increase their outputs; a larger quantity of the commodity is put in the market, and the market price decreases under a fixed demand condition. Now the individual sellers must adjust their marginal costs to a new market price. These adjustments can be continuous, as they commonly are in most kinds of American farming; or an equilibrium may be established in which the total output and market price do not undergo further changes. In any case, the individual competitor adjusts his marginal cost of production to a current or an anticipated market price.

Competitive pricing is the traditional social ideal of American economists. Adam Smith is the founder of the tradition; English economic thinking in the nineteenth century and early twentieth century, particularly the summation in Marshallian thought, is the main source of competitive economics; and many modern economists continue to center their reasoning on competitive markets and prices. Attached to a competitive standard, some economists quite naturally see competitive pricing as a desirable form of public utility pricing. At least the competitive pricing can serve as a bench mark with which the commission and judicial controls of utility prices can be evaluated. Harold Hotelling is one American economist who wants to adapt competitive pricing to public utility regulation.[1] Writing an article about both public utility rates and taxes (the rates for utility services are considered essentially the same thing as taxes), Hotelling wants to equate the prices to the marginal costs of service.[2] Prices are not chosen so that the total revenue equals the total costs—so that the fixed costs of service as well as other costs are covered. An equation of the marginal cost and the price is designed instead to get the maximum output of utility service; the largest social benefit thereby can be obtained from the utility plant. Use of the available plant and consumption of service are the important purposes of regulation; the earnings of a private company are secondary. Applying a popular but crude distinction, an economist says that the marginal-cost standard achieves production for use (consumption) rather than for profit.

Marginal-cost control of prices does not resemble the present cost control of public utility prices. Based on the reasonable total costs, the present control provides a private, static standard; the marginal-cost control represents a dynamic, social standard. Following the legal traditions of price-level control, commissions now focus attention on the property values of individual companies. Commissions do not want to allow returns on high property valuations, but are willing to permit them on moderate property valuations. And commissions insist on conservative accounting for depreciation; regulation of the depreciation cost and the reasonable return follows a temperate private standard of control. Seeing a vigorous commission in action, some persons may believe that earnings regulation disregards the private rules of business. An aggressive commission can write off excessive investment values to earned surplus or operating expenses, eliminate some taxes, salaries, and other expenditures from the reasonable operating costs, deduct the depreciation reserve or a required depreciation reserve from the rate base on which a reasonable return is figured, base the reasonable return on the original cost of only the useful and tangible property, and allow a low rate of return on the property valuation. This kind of regulation reduces the earnings of private companies. Yet the private conditions of production usually are respected; a just and reasonable return is really a just and reasonable return for a private firm.

The static nature of earnings regulation shows up in the small variations of reasonable-cost measurements. A reasonable depreciation cost for a company, which usually is measured by straight-line accounting for depreciation, is uniform or varies only slightly from year to year.

Controlled by depreciation accounting, the reasonable depreciation cost varies with the plant investment and the estimated service life of equipment, not with service output or consumer demand. And the reasonable return, too, is not adjusted to dynamic conditions. To compute the fair return, commissions commonly multiply a rate of return by the original cost of useful property. They use a fixed property valuation, and a variable rate of return. But they do not make frequent adjustments of the return rate, giving flexibility to reasonable-return measurements. Some commissions use the same rate of return for all or nearly all companies. And commissions commonly choose a rounded rate of return, such as 5 or 5½ or 6 per cent, that they do not change unless extraordinary changes occur in interest rates. As a consequence of stable depreciation cost and reasonable-return measurements, the price levels of utility companies lack flexibility. Some commissions may press down the property valuations, rates of return, and allowable operating expenses, but they do not adopt dynamic, cyclical plans of earnings control. Searching for convenient forms more than good achievements, they do not adjust regulation to the whole economy; they seek stable controls in an unstable economy.

Even though the present method of earnings control has some significant social defects, commissions are not so dissatisfied that they want to change over to a very different form of control. They are not yet ready to adopt a marginal-cost control of utility prices. Being a strange method of price regulation that clashes with the legal requirements and the conventional business standards of public utility control, the marginal-cost plan is not acceptable to companies, commissions, and courts. It subordinates the earnings objectives of private firms, and does not provide a good capitalistic pattern of price control. On the contrary, the courts and the commissions adapt earnings regulation to the private conditions of production, respecting the property rights and earnings expectations of utility companies. Attached to established regulatory procedures, courts and commissions commonly are averse to changes. Practical persons, seeing no chance for the adoption of such a new and extraordinary plan, want to drop the discussion. One conclusion is certain: a description of the marginal-cost plan does not make it more attractive to company managers, commissioners, and jurists. Yet something can be gained from further discussion. A social pattern of regulation can be contrasted with a private standard of control. The marginal-cost plan is a regulatory model that can be set against the fair-return model. And, given an environment of private business and democratic government, students of utility regulation can see some difficulties of making significant regulatory innovations.

SEVERAL CONDITIONS OF MARGINAL-COST CONTROL

To shift the regulatory emphasis from revenue and earnings to service production and consumption, commissions and courts must make many changes. They must drop the old reasonable standard of earnings control. An original-cost valuation or some other valuation of property, a fair rate of return, periodic allowances for depreciation cost, and summations of the past or the present operating expenses—all these currently significant facts of earnings and price control are eliminated. Property values, financial obligations, and accounting procedures lose their customary importance. Abandoning the traditional methods and purposes of price control, commissions must start from scratch to develop a new pattern of regulation. But before the operation of the new method is described, several conditions of the problem should be examined. Among these are the definition of marginal cost, and a distinction between short-period and long-period marginal costs. A corollary consideration is the difficulty of marginal-cost measurements. Another point is the difference between the several plants of a single company: since a firm may have more than one plant, the marginal costs must be averaged somehow unless the costs of an electric system, for instance, are to be differentiated according to the marginal costs of the different but related generating plants. And the different marginal costs of separate consumer classifications (e.g., residential, commercial, street-lighting, industrial, and other buyer groups of electric companies) must be taken into account.

A Definition of Marginal Cost. Measured for a single company or a single commodity, the total cost of production varies with total output. The total cost of one output is not the total production cost for any other output; at least the total production cost rarely is fixed for a company or industry regardless of the output changes. Increasing the total production of a commodity, a company commonly incurs additional costs of raw materials and labor; if the output continues to expand, additional management and maintenance costs or even additional investments in plant capacity are necessary. And the cost-output relation works in the other direction too: permanent contractions of total output usually are accompanied by reductions of the total production costs. Economists, accountants, and company managers recognize the general, positive correlation between output changes and cost changes. But while a cost-output relation is common knowledge, only the economists construct and use the special concept of marginal cost—or incremental cost as it is sometimes called. Measuring the marginal cost at any output point, economists divide the increase in total cost by the corresponding increase in total output. It is the addition to total cost that is incurred to produce an additional unit of output. Expressed in a more technical manner, the marginal cost of the x^{th} unit of output is the difference between the total cost of x and $x-1$ units of output. Marginal cost is a rate-of-change concept—a change in total cost relative to a change in total output.

Since the cost-output relation rarely is fixed for all time, the marginal costs of production often depend on the time period of plant operations. A distinction commonly is made between long-period and short-period marginal costs. Operating under long-period conditions, a company can choose different amounts of plant capacity; either the company starts from scratch and can choose any size of plant, or it has an opportunity to choose different amounts of plant capacity as plant replacements are made over a long time period. Computed under these conditions, the long-period average cost is the lowest average production cost for any output when the company (or industry) has enough time to make all necessary adjustments. And the long-period marginal cost, which is derived from the long-period average cost, is the additional cost of another output unit when the plant capacity can be varied freely. Such a measure of marginal cost includes additional investment costs (investor returns and anticipated depreciation costs) and management costs, because these costs, like raw material and labor costs, vary with output changes in long-period operations.

The concepts of long-period average and marginal costs are illustrated in Figures 4 and 5. Each cost curve in Figure 4 represents the

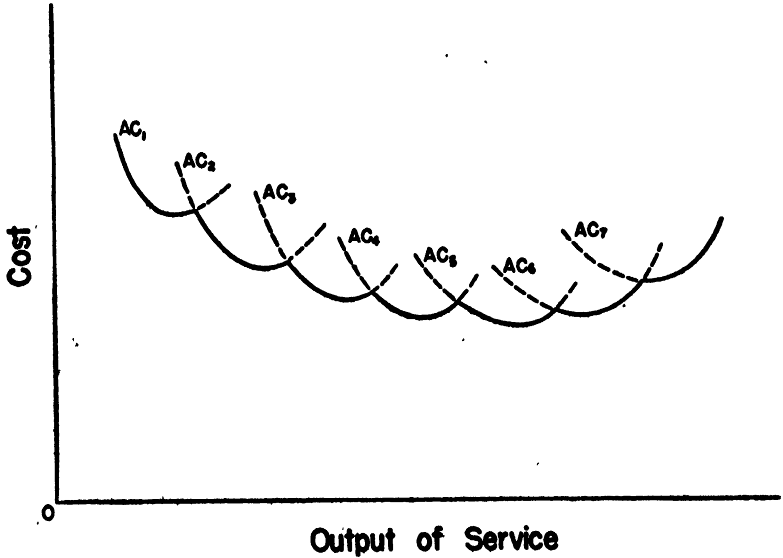

FIG. 4.

average production costs with the separate scale of plant. And the solid line, forming a succession of half loops, is the curve of long-period average costs; it represents the lowest average costs of long-period production.* Figure 5 contains another familiar measure of long-period marginal costs. Average-cost curves (AC_1, AC_2, and so on) again are drawn for separate plant scales. When numerous plant sizes are available and the technical conditions of production can be varied as much or nearly as much as the output itself, the long-period curve of average costs can take a different shape from that in Figure 4. The curve can be drawn tangentially to the several average-cost curves for separate plants.[3] This is the *LAC* curve of Figure 5. Now a long-period curve of marginal costs can be derived from *LAC*; it is the *LMC* curve of Figure 5. Such a marginal-cost curve measures the increments in total costs as a company shifts from one production scale to another. Long-period marginal costs include the additions to investment, management, selling, tax and plant maintenance costs, as well as the additions to raw material and labor costs.

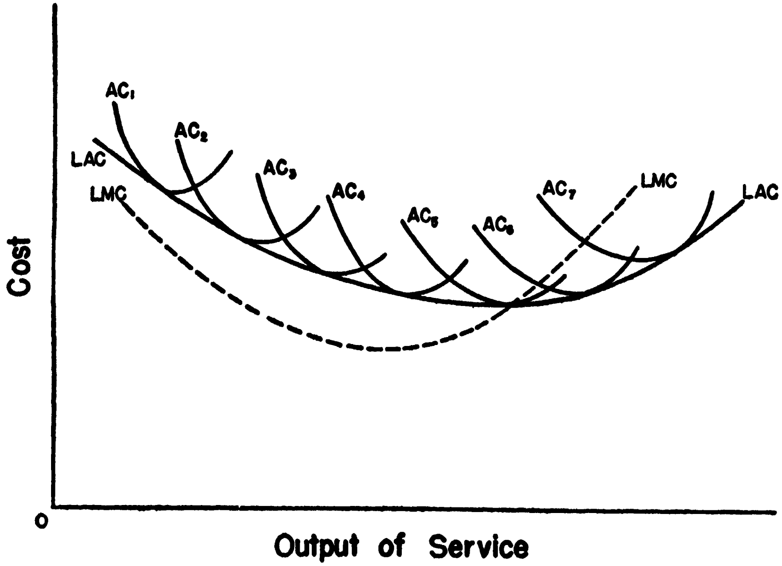

FIG. 5.

When the short-period marginal cost is measured, the plant capacity is fixed. At least the installed plant capacity commonly is taken for granted, and the fixed costs of the established plant (particularly the depreciation cost, investor return, some property taxes, and even some management costs) do not affect the calculations of marginal costs. The additional short-period costs are measured beyond the sunk costs that were incurred sometime in the past. Figure 6 shows the relation between average total costs, average variable costs, and short-period marginal costs. When the average total cost (*ATC*) and average variable cost (*AVC*) curves slope downward, the marginal cost curve (*MC*) is below them and is decreasing more rapidly than they are. When the average variable costs are constant (when the *AVC* curve is at its lowest point), the average variable-cost and marginal-cost curves intersect. And when the average total-cost and average variable-cost curves slope upward, the marginal-cost curve is above them. Marginal costs can be derived from either the *ATC* or the *AVC* curves, because increments in the total costs are equal to increments in the total variable costs.

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* A marginal-cost curve can be derived from this solid, looping curve of average costs. But it is no more than a succession of short-period curves of marginal costs.

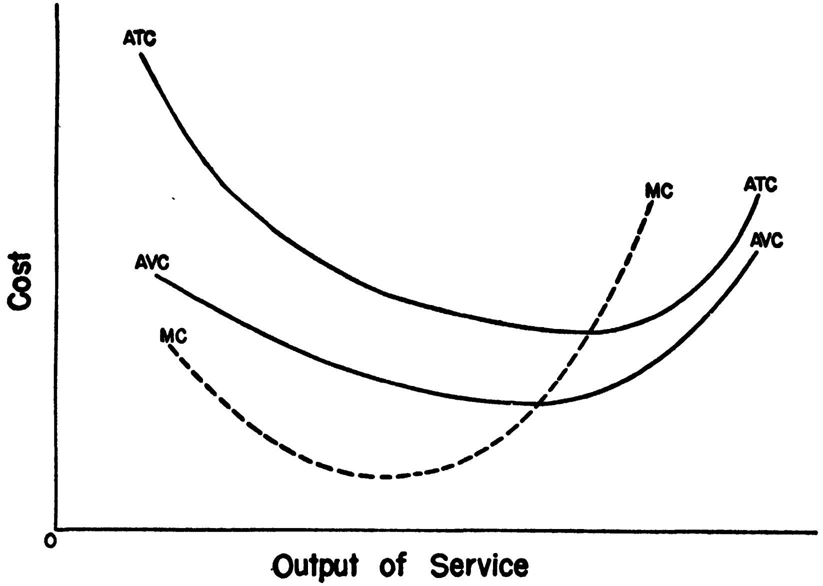

FIG. 6.

The Present Plant as a Datum. Seeking to equate the consumer demand prices to the marginal production costs, economists must choose a measure of marginal cost. Either a long-period, short-period, or some compromise measure can be chosen. Long-period measurements of the marginal costs have obvious merits: they include increments in all costs —the additions to current expenditures on labor and raw materials as well as the additions to investment, tax, management, and plant-maintenance costs. They are the additions to total costs that the investors expect as the total output expands. Including increments in all costs, long-period marginal costs are attractive to private companies and private investors who want to consider all possible cost changes. When prices are equated to long-period marginal costs, additional private investments in utility operations seem to be assured. These marginal costs are possible measures of reasonable costs for the commission that wants to encourage new investments and reinvestments.

The long-period measurements of marginal costs are difficult to make. To compute these costs, a company or commission must know the average costs for numerous scales of production; it must have cost information about plants that are not used by the company or that even are not yet used anywhere. Since this kind of marginal-cost measure is based on elusive or hypothetical data, it is not used in this chapter. To describe the marginal-cost plan, I shall assume that the existing plant is fixed and does not have an immediate bearing on the marginal-cost measurements. Given the established plant and neglecting the fixed costs of maintaining this plant, the commission measures the cost changes as the output changes. Yet, even if the present plant capacity is a datum for regulatory purposes, the cost changes are not always limited to changes in labor and raw material costs. As the output increases or decreases, irregular changes can occur in the tax, management, selling, and plant maintenance costs. And when investments must be made in the plant capacity before the output can be expanded or maintained, the marginal-cost measurements obviously must include something for the depreciation costs and investor returns of the new plant.

The measurement of marginal costs is simplified, but it is not settled just because a fixed amount of plant capacity is assumed. A general relationship of costs and production is evident: the total costs commonly change as the total output increases or decreases. But the exact nature of the cost-output relation usually is not evident. Marginal costs of some raw materials, such as the additional coal costs of electric-generating plants, may be nearly constant over long ranges of output. Perhaps the marginal costs of some labor are nearly constant too. But while management costs certainly vary in the general direction of output changes, the marginal management costs cannot be precisely measured for small additions to the total output. Marginal selling costs also are not readily measured. Perhaps the commission can measure the management, selling, and other such costs for large output changes, divide the large and irregular cost changes by the output changes with which they are associated, and obtain a rough measure of the marginal cost for an additional output unit.* And when the company invests in more plant capacity, the additional investment costs must be translated into a marginal cost. Estimating the probable service life and total future output of the new equipment, the additional investment can be translated into a marginal depreciation cost and a marginal investor return per unit of additional output.

The cost of a plant replacement is a special problem of marginal-cost measurement. Unless plant replacements are made now and then, the output of a company eventually contracts. Production of service can be maintained with plant replacements; but the output of service decreases without the reinvestments. Just as a new investment cost is properly translated into the marginal costs, so a plant replacement cost can be considered in the marginal-cost measurements. Again the probable service life and future output of the equipment are estimated; then the reinvestment cost can be turned into a marginal depreciation cost and marginal investor return per unit of the additional output. These are imperfect cost measurements. Yet, even if the translations into marginal costs are imperfect, the replacement costs still are necessary costs of output additions and should be considered in the cost computations. When the plant-replacement costs are figured in the marginal costs, a company clearly does not have a strictly short-period measure of the marginal costs. The marginal costs take account of current investments as well as regular expenditures for raw materials and labor. Even though an economist treats the existing plant as a datum, he cannot ignore the additional plant reinvestments unless he does not wish to maintain the output.

An "Average" Marginal Cost. As economists commonly construct the concept of marginal cost, it applies to a single productive unit—either a whole plant, a whole industry, or a single source of output.[4] But most utility companies have different kinds of productive equipment that do not have the same efficiencies. An electric company often uses several generating stations that range from nearly obsolete units to modern units; an urban transportation system may have several kinds and sizes of busses; a natural gas company may transmit gas through old, cast-iron lines as well as steel, high-pressure lines. Measuring the marginal costs under these conditions, a company gets different figures according to the kind of available equipment that is used. Several amounts of marginal cost can be computed for each output change. To solve this practical problem, a commission can equate the "average" marginal costs to the demand prices of consumers. A single curve of marginal costs is used to simplify the discussion in this chapter.

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* This is a sort of average marginal cost. A marginal cost is not computed for each separate unit of output. Instead, a lump of cost change is divided by a lump of output change; the result is an average cost increment for several or many additional units of output.

Different Customer Classifications. Another simplifying assumption is used here: the same marginal costs are assumed for all kinds of public utility services. Yet the marginal costs actually are not alike for all buyer classifications that are common in the public utility industries.* Electric companies, for example, differentiate between wholesale and retail services; regular retail buyers are separated from the off-peak customers; and the regular electric consumers commonly are classified into residential, commercial, industrial, street-lighting, and several lesser groups. Even though factual evidence is not available on the cost differences, the marginal costs of wholesale service probably are lower than those of most kinds of retail service because a company incurs less investment costs as the wholesale service increases. The marginal costs of residential service usually seem to be higher than those of industrial service. And off-peak service can be expanded more cheaply than any other kind of service. Realistic price control with marginal costs must be adapted to these service classifications.† Such an adaptation is not made here; in this chapter the same marginal costs are assumed for any separate kind of service. Marginal costs of production are treated as though they are the same for all customers.

THE PROPOSAL

The discussion finally turns to the way in which marginal costs of production can be used to control public utility prices. Several assumed conditions, which are described in the preceding section, must be remembered: fixed costs of the established plant capacity have no bearing on marginal-cost measurements, the investment costs of additional plant capacity or plant replacements are considered only when they are made, a single curve of marginal costs is assumed for a company, and marginal-cost control is not adapted to the present buyer classifications and price structures. Two price controls are used under this plan: the demand of consumers, and the marginal costs of service production. The general rule is an equation of demand prices and marginal costs. Sometimes, however, buyer demand is the primary control of the price; at least the company never sells the maximum available output for a lower price than the buyers are willing to pay.

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* These buyer classifications and the associated price differentiations are described in Chaps. 26 and 27.

† A similar problem concerns the geographic locations of markets. A single company, particularly in the electric, telephone, and natural gas industries, often serves farmers, villages, small cities, and large cities. Marginal costs of production are not likely to be the same for all these markets. Another problem of the marginal-cost proposal arises where price differentiation is practiced (as it often is) within a service classification, e.g., where a block schedule offers lower prices as a buyer's consumption increases. Each price in the schedule obviously cannot be equated to a separate marginal cost of service. An equation of the average price and marginal cost is inescapable in this case; keeping a differentiated price schedule, a well-regulated company sells some service below the marginal cost of production.

Demand Control of the Price Level. Taking the available plant capacity for granted and seeking the maximum possible use of the plant, the commission can sell the available service output for whatever the buyers are willing to pay. Consumers are willing to pay various demand prices for various quantities of service. At some demand price they will purchase the total plant output. This is the maximum-output price. Perhaps the commission does not or cannot extend output to the absolute limit of plant capacity. Some part of plant capacity may be reserved for sudden or day-to-day increases in demand. And all the unreserved plant capacity may not be used steadily throughout each day or each season, because buyers do not have constant demands for service. Thus, part of the total plant capacity, the reserved and off-peak capacity, is not fully utilized. Yet when maximum output is the objective, the general rule is the choice of a demand price that allows consumption of the available service. Like the farmer who sells a harvested crop at the prevailing market price, the utility company, too, sells the available service for the available price instead of the most profitable price.

When the maximum output of service is the purpose of price regulation, the demand prices of buyers ration the use of available plant capacity. Consumption is limited to the available output. The available service is distributed among buyers according to the quantities that they are willing to buy at various prices. Next, the maximum-output prices vary with demand changes. If the demands of buyers increase, the utility prices increase. And if the buyers, seeing better alternatives or experiencing reductions of their incomes, are willing to take smaller quantities of service at various prices, then the utility prices decrease. Finally, the maximum-output prices vary with the amount of unused plant capacity. If a company has a large plant relative to the demand for service, the initial price for service is low. But when unused plant capacity is scarce, the price for service is high.

Marginal-cost Control of the Price Level.[5] Demand prices of buyers, taken alone, are not satisfactory price controls for a utility company. A company may have so much unused plant capacity that the maximum-output price does not bring in enough revenue to cover the minimum cost of service. Such a firm does not get enough revenue to cover the current expenditures. Considering the producer side of price control, commissions must allow a price that induces current production of the largest possible amount of service. This is where the marginal-cost control of price comes in.* The price of service is equated to the marginal cost of production. Marginal cost is the difference between two successive amounts of total cost; it is the addition to total cost that is incurred as another increment in service output is produced. If, for example, the total cost of 100,000 kilowatt-hours of electricity is $5,000 and the total cost of 110,000 kilowatt-hours is $5,300, then the additional cost of the additional 10,000 units is $300; the marginal cost per unit of additional output is 3 cents.

The marginal cost at any output point measures the minimum price at which a private company is willing to produce the output. A private company expands production to the output point where the marginal cost and price are equal. This is true as a consequence of the marginal-cost definition. The marginal cost of an output is the added cost of production; it is the cost increment that must be covered by a revenue increment before the production is extended. So, if a commission wants a certain amount of output, the price must be equal to the marginal cost of the output. Marginal cost fixes the minimum price of production.

The demand of buyers is the other basic determinant of the price. When demand prices of buyers and marginal costs of production are the principal factors of the pricing problem, the intersection point of the marginal cost and the demand curves determines the average price at which utility service is sold. While the company gets a price that is equal to the minimum cost of production, the buyers purchase only as much service as they want at the price level. This is an equation of the minimum price at which the company is willing to sell the output, and the maximum price at which buyers are willing to purchase the same output. Equated to the marginal costs of service, the price varies sometimes with demand changes. If the marginal costs are constant, demand changes do not affect the price. But if these costs increase as the output decreases, then the price changes go in the opposite direction from the demand changes, rising as demand decreases and falling as demand increases. And when the marginal costs of production increase as output increases or when the marginal costs decline as the demand decreases, the prices go up and down with demand increases and decreases.

The relationship of marginal costs and consumer demand are illustrated graphically in Figure 7. The *ATC* curve represents the average total costs of producing various outputs; *MC* is the curve of marginal costs of production; and D_1 and D_2 are two different demand curves of the buyers. When D_2 represents the buyer demand, the demand prices and marginal costs are equated at P_2. P_2 is the price, and OQ_2 is the maximum output. But when demand decreases to a D_1 position, a new price, P_1, is established and a new maximum output, OQ_1, is produced.

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* Marginal-cost control of utility prices restricts price reductions, but it does not restrict companies to reasonable earnings. Sometimes it allows more than reasonable returns. These effects of the plan are discussed later.

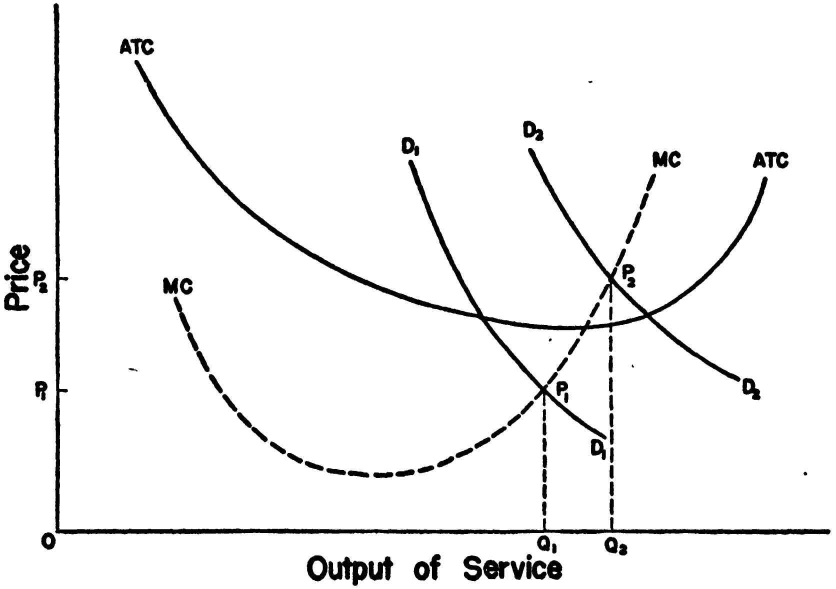

FIG. 7.

Demand Conditions. The price for utility service need not be changed every time the conjunctive relationship of marginal costs and demand allows a change. Small price changes are awkward to handle, because they must be translated into fractional changes of price schedules. And frequent price changes put a heavy administrative burden on commissions. Consequently, as they follow the marginal-cost plan of price control, commissions need not take account of every demand or cost change. Small increases or decreases in demand can be ignored until a number of small demand changes accumulate, until significant changes can be made in the price level and price schedules. Daily, weekly, and monthly fluctuations in demand are expected. Most companies, indeed, keep a reserve plant capacity so that sudden, temporary demand increases can be met. Perhaps semiannual or even annual price changes are adequate for most demand conditions and most companies. At any rate, a perfect, continuous equation of demand prices and marginal costs is impossible. Companies and commissions probably can do no better than follow the general principle of the marginal-cost plan.

Sometimes the commissions must anticipate buyer responses to price changes, particularly to extraordinary price reductions. Consumers of electricity and gas, who commonly buy expensive appliances before they buy more utility service, should not be misled by price reductions that cannot be permanent. Let us imagine that an electric company has much unused plant capacity, and that the marginal cost of production is 5 mills a kilowatt-hour. Making an immediate price reduction to 5 mills, the commission is likely to induce many families to buy electrical appliances. Then, after the consumers begin to use more appliances and to consume more electricity, the marginal costs of production increase. The price for service may increase severalfold. Now the consumers realize the temporary nature of the price reduction, and they feel deceived. To avoid friction with consumers and to reduce unwise consumer investments in appliances, the company and commission must look ahead to the full consumer responses to price changes. Studying buyer demand, they must not be guided by immediate sales at all possible prices. Allowing time for the buyers to change their consumption habits, they seek ultimate equations of marginal costs and demands rather than many instantaneous equations.

The Dual Controls. This is a good time to remind ourselves that the marginal cost of production is not the only control of price. There are two methods of price control: the conjunctive relation of marginal costs and demand prices can determine the price, or the demand prices *alone* can control the choice of a price. When a company has much unused plant capacity, the equation of marginal cost and demand prices fixes the limit of private production. It determines how much of the plant is utilized. But when plant capacity is scarce relative to the demand for service, the equation of marginal costs and demand prices can be out of place. (This is a special condition that is not shown in Figure 7.) Perhaps the current marginal costs of production are small, and consist principally of raw material and labor costs; they do not increase sharply until plant investments are made. The marginal-cost curve and the demand curve cannot be equated within the present limits of plant capacity. This is a simple illustration of the condition: the marginal cost of production is 1 cent, but consumers are willing to buy more than the total plant output at 1 cent for each unit. Now the demand prices alone control the price; the price is fixed so that the available service is rationed among buyers. Under these conditions the demand prices, rather than the marginal costs, determine the regulated price.

Demand control of the price is a special condition of plant investments. Controlled by demand prices alone, the regulated price increases with the demand for service. Perhaps it increases before the utility companies make investments in plant additions. These companies can put off reinvestments or new investments, in fact, until the increases in prices justify the expenditures. After the investments are made in plant, a different condition exists. The marginal cost of further service production drops back to a low figure, and additional output from the recently installed equipment necessitates only a small increment in the total cost. But the prices are not equated to the nominal cost increment unless an excessive addition is made to plant capacity. Again demand prices, which are used to ration the limited service output, restrict the price reduction and fix the minimum price.

The Plant Rental. Controlled by demand prices alone or an equation of marginal costs and prices, the total revenue of a utility company obviously contains no specific provisions for depreciation cost and an investor return. These overhead costs of service are not determinants of the price. Some of the depreciation cost, which is a function of plant use and service production, can be counted among the marginal costs, though a measurement of only wear-and-tear depreciation ("use" depreciation) is not easy to make. But most of the depreciation cost is a result of weathering, demand changes, and technical innovations; this part of the depreciation cost is not included with the marginal costs of production. Nor do the marginal-cost computations include something for fair-return allowances.* A property valuation has no significance in this kind of price control. As Hotelling, proposing a marginal-cost control of prices, sees a valuation of public utility property, it is an "interesting historical question," but not a "measure of the value to the country of the investment." [6] He says, "It will be better to operate the railroads for the benefit of living human beings, while letting dead men and dead investments rest quietly in their graves." [7]

A utility company may get enough revenue, however, so that the depreciation cost is recovered and an investor return can be paid. Following the marginal-cost and demand-price plan of control, a company can obtain more total revenue than the total current expenditures for labor, taxes, raw materials, and plant repairs. It can get a plant rental. This, like a land rent, is paid because productive equipment is scarce. (Managers and investors of utility companies, whose reactions to the marginal-cost plan are discussed in the next section, naturally want to get large plant rentals or even to maximize the rentals.) If a company has a large amount of unused plant capacity before the marginal-cost plan is put into operation, it receives a small plant rental or no rental at all. On the other hand, if the firm has no unused plant capacity (except for off-peak and reserve capacity), it receives a large plant rental. The rental is determined basically by the relation of consumer demand and available plant capacity. And it can be smaller or larger than the depreciation cost and reasonable return that are measured in the traditional regulatory manner.

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* The depreciation cost of property and returns on past investments are not determinants of the current prices for a competitive industry. A single wheat farmer, who competes with many other farmers, cannot control the market price of wheat. Nor does his past investment in a farm or equipment have any bearing on the price that he can get for wheat. He can compute the depreciation cost and a return on his investments, but he still gets no more than the market price. Being in a competitive industry, the farmer gets his largest land rent when he equates the market price to the marginal cost of production.

The plant rental of a company is the difference between the total revenue and total variable cost of the firm. Total variable cost can be defined as the minimum total cost that a company incurs to maintain a certain output. Consequently, the plant rental is the revenue that a company obtains above the minimum current cost of the immediate service production. One fact should not be overlooked: the plant rental does not affect the price for service. Rather, it is determined by the price. Either the relationship of consumer demand and available plant output, or the relationship of marginal costs and demand prices determines the price. The price controls the total revenue, while the output controls the total variable cost. If a company operates under these conditions, the plant rental is measured after the price is set. It is a residual sum.

The measurement of the plant rental is the same under both methods of price control. When the price is determined by the demand prices alone, the plant rental is, as under the alternative procedure, the difference between total revenue and total variable cost.* And when the marginal cost and the consumer demand are equated, the plant rental also can be measured by the difference between marginal cost and average variable cost times the output. This measurement is described in Figure. 8. *ATC, AVC,* and *MC* are, respectively, the average total cost, average variable cost, and marginal-cost curves. To facilitate the description, we can use imaginary, smooth cost curves here. D_1 is the demand of all buyers. The price, P_1, is determined by the intersection of the *MC* and D_1 curves. Consequently the per-unit rental at output OQ_1 is measured by the distance from P_1 to point *C* on the *AVC* curve. The total rental is the per-unit rental, P_1C, times the output OQ_1. This total rental can be described, too, by the rectangle, $ABCP_1$.

The plant rental is not a fixed amount. Controlled by the demand prices alone (when the marginal cost and demand cannot be equated), the plant rental varies in the same direction as demand changes. If demand increases, the price level and the plant rental increase. And if the demand decreases, the regulated price and the plant rental decrease. Controlled by an equation of the consumer demand and the marginal costs of production, the plant rental varies with both demand and cost changes. Under both pricing methods the variations of plant rentals have some common characteristics. If unused plant capacity is scarce and demand is increasing, the plant rental is increasing too, and can be large. If there is much unused plant capacity, however, either because demand decreases or because the company has excessive plant capacity, the plant rental can be quite small. The depreciation cost and reasonable return on past investments, therefore, may or may not be covered by the plant rental. Coverage of these overhead costs depends primarily on the consumer demand and the intensity of plant use.

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* When the plant facilities are not large enough to meet all demands, Hotelling wants to include a rental charge in the price so that the service demand is equated to the service output. Rental charges, he thinks, can be used to eliminate the crowding of railroad passenger coaches; they can be increased during the holiday and summer travel seasons, and can be reduced at other times. Since the marginal cost of one more passenger is small unless a whole additional train must be run for him, Hotelling believes that rental charges can "largely take the place of fares." [8]

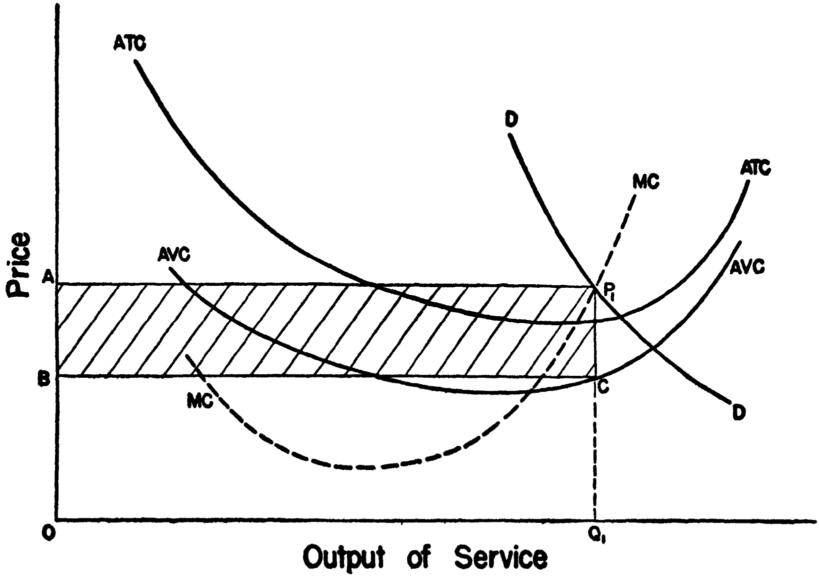

FIG. 8.

Figure 9 shows the effects of demand changes on the plant rental. Figure 9 is the same as Figure 8, except for three different demand curves, D_1, D_2, and D_3. Let us suppose that the total costs of production include the depreciation cost and the reasonable investor return. If so, the *ATC* (average total cost) curve measures the minimum prices whereby the depreciation cost and reasonable return can be fully recovered. Given a demand condition of D_2, a company gets a plant rental that is just large enough to cover the depreciation cost and reasonable return. This equa-

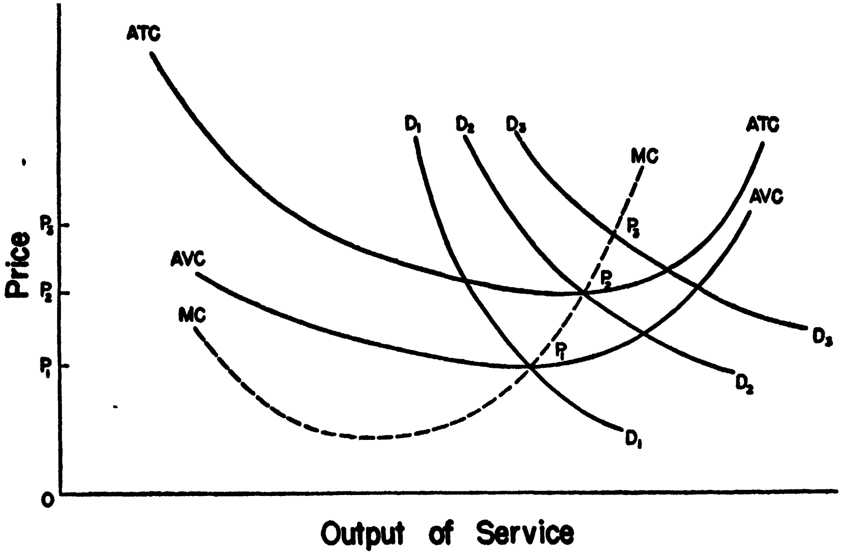

Fig. 9.

tion of marginal cost, demand, and average total cost is a coincidence. On the contrary, when the demand is D_1 and when the price is equal to the average variable cost, there is no plant rental. Between P_1 and P_2 the company can recover some of its old plant investments; and as the price approaches P_2, the company also gets a partial return on the old investment. But when the demand increases above D_2, the utility company receives a total revenue that is more than sufficient to cover the depreciation cost and the investor return. Using its plant intensively, a utility firm can prosper under the marginal-cost pattern of price control.

SOME REACTIONS OF PRIVATE COMPANIES

An equation of the marginal-cost and the consumer-demand prices is not a private standard of pricing.* It is a social standard; using this

* Some managerial choices of prices, which are discussed in Chap. 25, seem to be controlled in part by cost increments. As utility companies try to develop new uses for their services and make some alterations of their rate schedules, their choices of prices apparently are controlled more by cost increments than by average production costs. This influence of marginal production costs is evident in off-peak rates, where the cost increments are low and consist largely of raw material and labor costs, as well as regular services where the marginal costs may consist of investment, management, plant-maintenance, and tax costs in addition to raw material and labor costs. These companies want to choose new prices so that the addition to revenue exceeds the additional costs. There is a significant difference, however, between this managerial use of cost increments and the marginal-cost plan that is discussed in this chapter. Each price is not equated to a marginal cost of production. Instead, the marginal costs are used to carry out monopoly pricing—to increase earnings and to differentiate prices.

equation, a commission can realize the most efficient social use of the available productive facilities. But private companies are in business to make profits, not to expand the production and consumption of commodities. Bent on getting profits, private investors and managers want to get more total revenue than total cost. A large plant rental, which is obtained because plant capacity is scarce relative to consumer demand, pleases them; the rental can be used to cover the depreciation cost, an investor return, and other fixed costs for the existing plant. Since a shortage of plant capacity allows a higher return than an abundance of plant capacity, the firms are not encouraged to make new investments. The marginal-cost plan is not a good way to stimulate private investments.

A Scarcity of Plant Capacity. Given the right conditions, either the marginal-cost or the demand method of price control can be beneficial to private companies. It can be a source of profit. This is true when the unused plant capacity is scarce relative to the demand for service. Equating the price either to marginal production costs or to demand prices alone, a company can obtain a large plant rental. If a firm operates under a condition of increasing marginal costs, it receives a larger and larger plant rental as the output increases. And if the price is controlled by demand prices alone and is fixed at a point where consumers are just willing to purchase the available service, the plant rental increases with consumer demand.

A scarcity of plant capacity is attractive to private investors. Dividend payments are highest, the risk of corporate reorganizations is lowest, and the recovery of past investments is most complete when the utility companies have no unused plant capacity. Small, obsolete plants can have larger plant rentals than large, modern plants; unused plant capacity is a more important factor than efficient production. As the price increases, the quality of service can deteriorate. A utility company prefers to squeeze service out of the existing plant, deferring possible sales, avoiding the responsibility to serve all who come, and trying to maintain operations under an increasing cost condition. Disregarding the deterioration of service, the firm naturally tries to maximize the plant rental. We can say, therefore, that an "inefficiency" rental is given to a utility company which has a small, old plant.

A large plant rental is a special regulatory problem. Using the old form of earnings control, the commission can reduce the rental to a reasonable sum. Operating costs, depreciation cost, and a reasonable return on some property valuation can be added up; if the total revenue exceeds this sum of total reasonable costs, the rental is excessive and the price is reduced. But a price reduction does not solve the problem. When the price is reduced, the plant cannot produce enough service to satisfy buyer demands. The plant rental and price may not be high because the marginal costs are high; the price may be controlled altogether by the consumer demand. To solve the problem, the commission needs more investments, more plant capacity. The commission can afford to translate the additional investment costs into a marginal depreciation cost and marginal investor return per unit of additional output. This is a way to bring the marginal costs and prices together—to avoid complete reliance on demand control of prices. Unless the companies get no more than reasonable plant rentals and can be induced to make some reinvestments and new investments, the marginal-cost plan is not a success in the long run.

Some investments and reinvestments can be obtained with wise, forceful regulation. Seeing an excessive plant rental, the commission can give the company a choice between additional plant investments and a reduction of the rental.* Commission regulation or taxation of rentals is an indirect method of forcing a plant expansion or replacement. Other investments may be made voluntarily by the companies. Fearing the antagonism of consumers and avoiding the possible chance of a public-ownership movement, the companies do not always skimp on plant capacity. They try to serve some new customers as well as their old buyers, and are not determined to maximize the plant rentals. But the firms still may have cautious investment policies. While they may not seek excessive rentals, they want to get liberal rentals—enough revenue above current expenditures to pay all costs and build up a sizable cushion against uncertain future conditions. The future demand for service is an important uncertainty; if the demand decreases, the price and plant rental are likely to decrease too. Facing more uncertainties of future earnings than they experience under the present regulation, companies naturally take more care with their investment decisions.

An Abundance of Plant Capacity. When plant capacity is scarce relative to consumer demand, the plant rental is low. This rental is not large enough to cover all the depreciation cost, interest charges, reasonsable dividend payments, and even some management costs that are associated with the established plant. Now the price regulation can give short-period benefits to the consumers. The price of service is reduced, and the excessive plant is used to produce service rather than profits.

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* Either taxation or price regulation can be used to reduce the rental. A rental reduction with price control, which is discussed in the preceding paragraph, disturbs the balance between consumer demand and service output. When the price is reduced, consumers want to buy more service than the company can produce with the available plant; the demand is not equated to the supply. Taxation, on the other hand, does not disturb the price that equates the demand to the service output, but it does take away part of the rental. Using a special form of taxation, the state government recaptures the excessive part of each rental. Public utility commissions, already experienced in earnings regulation, seem to be better qualified than tax commissions for rental control. Even if special taxes must be devised, taxation still seems to be the best way to cut down the plant rentals to reasonable sums.

Since the past investments (which gave the company unused productive capacity) are ignored and no significant additional investments are being made, the marginal costs are low and the price can be reduced a great deal. The investors get smaller returns or no returns at all, and the consumers get more service. Reducing the unused plant capacity, marginal-cost control of prices gives more immediate benefits to consumers than are given by an average cost control of prices.

When a company has a large amount of unused plant capacity, an equation of the price to the marginal cost does not satisfy the minimum earnings objective of the firm. The total revenue is less than the total cost; the company incurs an accounting deficit. Perhaps the company does not even have enough cash to pay the interest charges on its debt securities; if so, the equation brings on a receivership.* But a company is not compelled to accept the low plant rentals forever. It eventually can eliminate the unused plant capacity. When the times for plant replacements come, the company scales down the plant capacity. It tries to make the plant capacity scarce relative to the consumer demand, seeks a higher price, and wants to maximize the plant rental. Taking a conservative view of future demand conditions, the company gives more attention to possible demand decreases than to possible demand increases. Investments in plant enlargements or innovations are cautiously made or withheld altogether. A condition of underinvestment is preferable, indeed, to one of overinvestment. Thus, while the marginal-cost plan gives consumer benefits in the short period, it can be turned to investor advantages in the long period.

Financial adjustments to marginal-cost pricing are rough on the private companies. Seeing credit impairments, corporate reorganizations, conservative investment policies, and increases in interest rates because the uncertainties of earnings are greater, commissions may want to temper the financial effects of the pricing procedure. Subsidies can be paid the companies while the plant capacities are gradually contracted. Distributing these subsidies so that the credit standings of companies are maintained, the commissions can control the plant contractions and try to prevent extremely conservative judgments of the future demands.† Or it can allow the companies to keep some of their excessive rentals during prosperous times so that the revenue deficiencies during business depressions are partly or wholly covered. As a third adjustment, the commissions can use a long-period rather than a short-period measure of marginal costs. Choosing this alternative (which is described in the first part of the chapter), commissions measure the increments in total costs as the scales of production are increased. Marginal costs include increments in all costs—depreciation, capital, tax, selling, and management costs as well as labor and raw material costs. Unfortunately the long-period measurements of marginal costs seem to be more difficult to make than the short-period measurements. The general concept of long-period marginal cost can be used, but no exact application of it is possible.

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* In another connection J. M. Clark says, "A price which at all times covers only short-run marginal cost would lead to large operating deficits whenever demand is short of capacity, and would bankrupt most industries no matter how shock-proof their capital structures." [9]

† Such subsidy payments are even more improbable at the present time than the marginal-cost method of price control. Even if the commissions can figure out a way to distribute them, the subsidies have no perceptible chance of approval by state legislatures or Congress.

OTHER LIMITATIONS

Based on social considerations rather than the conditions of private investments, marginal-cost control of prices has a significant defect as long as the country relies on the private production of utility services. This is not its only limitation. One practical difficulty is the measurement of marginal costs. Another limitation is the judicial concept of reasonable price control that is firmly established in legal thinking. And as a third fact the commissioners, who want simple and workable methods of control, are not attracted to marginal-cost pricing.

Measurement of Marginal Costs. Some problems of marginal-cost measurements are discussed in the first part of the chapter. A general relationship of total cost and total output often is evident: both usually increase and decrease together. But the exact nature of a cost-output relation is not easily identified. Even if the costs vary commonly with output changes, companies and commissions cannot know just how much the labor, management, maintenance, selling, and tax costs increase or decrease as changes are made in the total output. A special problem is the translation of additional investment costs into marginal depreciation costs and investor returns. And before a commission finishes the measurement job for a company, it must ascertain the different marginal costs for the several markets or customer classes. The current accounting procedures and systems are not useful for marginal-cost calculations; instead they give measures of some average and total costs.[10] To compute the marginal costs of public utility services, commissions must start from scratch and cannot expect to get more than approximate answers.

Confiscation of Property. Following the decision of the Hope case and subordinating the method of earnings regulation, the Supreme Court gives commissions much scope of regulatory action. Yet, even if the Court is more interested in the result than the method of earnings regulation, it is not likely to approve any procedure of price control. A social method of control, such as the marginal-cost plan which is designed to utilize available plant rather than to reward investors, doubtless is unacceptable to jurists. The Supreme Court still seeks to protect private property, to attract private investments to utility industries, and to perpetuate private production of utility service. It does not wholly disregard the recovery of private investments and the earnings expectations of private investors. Using the marginal-cost plan, a company can get a plant rental. But the rental, which depends on the cost and demand behavior, may be above or below a reasonable return. The rental can exceed the reasonable return and the depreciation cost; or a company can cover only its total variable costs and get no rental at all. Derived from the price, the rental is a residual sum that is not determined by the total costs of service. Seeing these facts, jurists may believe that the rental is a whimsical consequence of arbitrary regulation.

The Commissioners. Being administrators who like to get jobs done quickly, utility commissioners often want a simple, expedient method of earnings control. But the marginal-cost method is so complex that many regulators cannot quickly understand it or easily use it. Being practical, political-minded men, the commissioners wish a method that is tested by experience rather than general reasoning. But the equation of marginal costs and consumer demand is an idea that is not yet tested in practice. Leaning toward the tradition of private enterprise, commissioners usually want to give some returns to private investors. But the marginal-cost proposal disregards the investor returns, and is directed toward service production. Trusting their common sense, regulators are certain to call the marginal-cost proposal an unrealistic plan of control. To the public officials it is a strange idea, based on peculiar reasoning and expressed in an unfamiliar language. Since these men are rarely interested in what they consider odd thinking, nothing short of a general upheaval in utility regulation can drive them to study the idea.

Chapter 21

Output Controls

COMMISSIONS NOT only control the prices and costs of utility companies, but also regulate the performance of service by the systems. Among the output problems are the quality of service units, service extensions to all buyers in a company's market area, extensions into new areas, and abandonments of service. Buyers expect excellent service from their utility companies. They want "good" utility service just as much as they want to pay low prices for it. Even if a consumer uses coal or oil for cooking or water heating, he still wants the opportunity to buy gas or electricity as soon as he decides to give up a nonutility source of heat. The utility firms are expected to serve "all who come"; and they are supposed to serve them without discrimination. Utility companies, too, are expected to standardize the quality of service. Water is supposed to be clear and pure; electricity should be distributed steadily and with only nominal voltage variations; the heat content of good gas service is maintained at specified figures; and telephone calls should be made fast and should be nearly free from interferences. As a further duty, utility firms cannot freely abandon service for part or all of the buyers. After a company has a public utility status and some buyers demand service, it cannot withdraw from any part or all of the market area unless the permission of public authorities is obtained.

All commissions have some authority over the service performance. The legislatures usually delegate extensive general powers over service standards to them; commissions can determine and prescribe "adequate and reasonable" standards. Given the authority to demand "adequate" service from utility companies, commissions can fix broad rules of service production and distribution. They can choose rules for the continuity of service, standardize the measurement of buyer consumption, fix technical definitions of output units, and require decent treatment of customer complaints. They usually have authority to make investigations, meter tests, and otherwise check on managerial obedience to the prescribed standards. And the requirement of "adequate" utility service is applicable to service extensions. Receiving broad regulatory powers from the legislatures, most commissions can control the construction of new gas, electric, urban transportation, telephone, and water lines within the market areas that are defined by franchises or commission certificates.

Yet, as regulation has been practiced in this country, the control of service has received far less attention than the control of prices and earnings. Commissions have not always accepted the pricing policies of the companies, but they have accepted most of the production and distribution practices established by the private firms. Nothing has affected the quality of utility services so much as investments in technological changes. For instance, the research work of Bell Telephone Laboratories and Western Electric and the investment decisions of telephone companies have done far more than commission regulation to make telephone service what it is today. Furthermore, the utility companies usually have maintained accurate meters, continuous electric and gas service, pure water, and so on. Nor have the utility firms refused to exploit and expand most of the available markets. They have not waited for commission orders to make most service extensions or to find new uses for their products. Using advertising, appliance demonstrations, and sundry forms of salesmanship, they have sought new sales. Seeking more earnings, utility companies have been willing to maintain service standards, and to widen the intensive and extensive limits of their markets. A high-grade, expanding service has accompanied the quest for more earnings. So the commissions usually have left service policies to the companies, and have concentrated regulatory action on earnings and prices.

THE OUTPUT UNIT

A minimum of output regulation requires some definitions of the output units for the several kinds of service. For each utility company or industry there are several possible choices of output units. For instance, the unit of bus service can be something more than a ride on a bus. It varies according to the kinds of busses, the number of busses operating on each route, the behavior of bus drivers, and so on. Or the unit of telephone service is broader than the single telephone conversation. The number of subscribers on each line, the speed of call connections, and line interferences are some important variables of local telephone service. Along a rural telephone line, which is used jointly by all subscribers, only one call can be made at a time, and no subscriber expects private conversations. But in the cities a subscriber can have immediate and private telephone service if he buys single-party service. The output unit for any kind of utility service is defined, primarily, according to certain technical dimensions and certain maximum variations in these technical dimensions; and it is defined, secondarily, according to a few nonprice relations of buyers and sellers. In the case of water companies, for instance, the important service condition is the purity of the water, and the lesser service conditions are water pressure, the maximum capacity of the system, and the handling of customer complaints.

Electric Service. The most important characteristics of the electric output unit are: (1) voltage and frequency of the electric current, (2) the number and duration of service interruptions, and (3) the accuracy of electric meters.* In connection with interruptions a distinction must be made, of course, between regular service, which is available at all times, and irregular service which is available only during certain hours or seasons. And further distinctions may be made between the regular output unit for industrial, residential, street-lighting, and wholesale service. Since electric motors and appliances are constructed to use electricity of a certain voltage and frequency, a voltage or frequency variation affects the efficiency of electric equipment and the cost of service. State commissions frequently prescribe maximum limits of voltage variation; in New York, for instance, the permissible variation is 2 per cent above or below the prescribed voltage.[1] Some commissions regularly inspect the voltages of electric service; others leave the voltage controls to the companies, and let consumers take the chances of getting substandard service. Service interruptions, which become less and less frequent as technical improvements in electric plants are effected, can be disturbing enough to residential consumers of electricity; but they can be costly to some industrial buyers of electricity. Furthermore, the importance of accurate electric meters is obvious; commissions usually allow a meter variation of 2 per cent above or below a perfect recording.

Commissions commonly do not fix specific standards of buyer-and-seller relationships for electric companies. The companies are expected to be courteous to consumers, and to investigate customer complaints promptly.[2] But most utility companies do not need supervision of their consumer relations. Many of them are well known for their affable customer relations, their prompt investigation of customers' troubles, and their special services such as free bulbs or appliance inspections and repairs. Not only do the companies find these customer relations a means to larger sales, but also the buyers are less likely to take complaints to commissions and to start general investigations of service conditions, prices, and earnings.

Gas Service. The important conditions of gas service are the heat content of the gas, the steadiness and amount of gas pressure, continuity of service, and accuracy of meters. One thousand cubic feet is the common unit of gas sales. The heat content of manufactured gas usually is fixed between 500 and 600 British thermal units for each cubic foot. And commissions usually allow a 5 per cent variation above or below the prescribed B.t.u. content for a cubic foot. For natural gas the number of British thermal units varies, of course, according to the pool from which the gas is drawn. Methane ("dry") natural gas, which is the best natural gas for public utility service, commonly contains about 1,000 B.t.u. a cubic foot. There is sometimes a difference, too, between the sales units of natural gas and manufactured gas. In some cities, where natural gas was substituted for manufactured gas after 1930, straight natural gas or a mixture of manufactured and natural gas is sold in "therm" units. A therm is commonly defined as 100,000 B.t.u. This change was made because the companies did not want either an increase in the M.c.f. price for the new gas, or a revenue reduction from selling the new gas at the old cubic-foot price.*

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* The Bureau of Standards set up the only comprehensive, technical standards of electric, gas, and telephone service. Most of the work on these standards, except for a 1934 revision of the gas service standards, was done in the early twenties.

Gas pressure must correspond to the pressure for which the buyers' equipment is designed. Yet, when an extraordinary but temporary increase in demand occurs as on Thanksgiving Day, the commissions tolerate some decreases in gas pressure. Commissions also expect gas companies to prevent gas leakage, and to control the impurities in the gas such as sulphur or ammonia which corrode pipes and affect the operation of appliances. Meter testing is as important for gas companies as it is for electric companies.† Gas companies, like electric companies, ordinarily are allowed a maximum meter variation of 2 per cent above or below a correct recording. Extension of customer gas lines is another service requirement; a gas company's obligation may be limited, for example, to seventy-five or one hundred feet of service line for each customer.[5]

Telephone Service. Although only a few commissions prescribe output units for telephone companies, the unit is determined by the speed of calls, the quality and amount of equipment, the interferences with speech transmission, the number of subscribers on each line, and access of the local subscriber to intercity telephone service. Differences in equipment often explain the variations in telephone service. Manual switchboards, which still are used in small telephone exchanges, cannot handle calls so fast as dial systems can. Underground conduits assure more continuity of service than the overhead lines that often are torn down during wind and sleet storms. And output units of telephone companies are differentiated according to the number of subscribers on a line; urban subscribers can choose single-party, two-party, and four-party service, while six or more customers may share a rural line. Further distinctions are made in output units between residential, commercial, coin-box, and private exchange service. The telephone service of a community, furthermore, is measured by the availability of long-distance as well as local service. Sometimes the state commissions order interconnections of telephone exchanges, and thereby bring the long-lines service of the Bell system to small towns. And commissions allow other distinctions in toll service: station-to-station, person-to-person, daytime, nighttime or Sunday (off-peak) calls.

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* When the therm unit is used, a buyer's gas consumption still is metered in cubic feet. Then, to compute the therms for each buyer, the company multiplies the cubic feet of consumed gas by the average B.t.u. content of the gas and divides by the number of B.t.u. in each therm.

† Unlike many other state commissions, the New York Commission makes many tests of gas and electric meters each year and frequently checks on the B.t.u. content of gas.[3] In some other states the gas and electric companies are required to inspect all meters every five or more years.[4]

Water Service. Nothing is so important, of course, in water service as the purity of water. The purity tests are made, however, by the state health authorities instead of the utility commissions. Water pressure is another dimension of the service unit. A distinctive condition of the water service is the provision for fire protection. A water company is expected to have more plant capacity than it needs for domestic and commercial consumers. And some water firms also install and maintain fire hydrants. Water companies, like gas and electric companies, must have accurate meters. Some water systems also are expected to install customer main extensions; an extension of seventy-five or one hundred feet is a common limit of the obligation.

Urban Transportation. A commission can readily recognize the general dimensions of a desirable output unit for urban transportation service, but it cannot fix technical definitions of this unit so easily as it can for electric, gas, or water service. Two problems are the number of routes, and the frequency of service along the routes. When they live in the more sparsely populated sections of a city, people necessarily walk farther and wait longer than other riders for transportation service. Another dimension of transportation service is the integration of route schedules, and adherence to time schedules. One of the tests of service quality, furthermore, is the capacity of the company not only to provide service throughout a day, but also to handle the rush traffic expeditiously. Finally, there are important service considerations about adoption of improved equipment, packing persons into streetcars or busses, training the drivers and motormen, and safeguards against accidents. The quality of transportation service, like the standards of other utility services, usually is controlled by the companies.

Relation to Earnings and Prices. The output unit is not standardized for all times, places, and uses of each utility service. If the output units were uniform under all conditions, the prices would be higher in many towns and areas than they are now. If in any large city the same frequency of urban transportation service were maintained throughout a day, the expenditures of the companies would be higher than their present costs. Forced to provide more frequent service, a street railway or bus company either wants higher prices, or wants to abandon some routes. Likewise, if all farmers want private telephone service, they must pay higher prices than when they share a line with several other farmers. There is clearly a relationship between prices and output units. The legal concept of "adequate" service cannot be disassociated from the prices at which the service is sold. In some places the buyer's best bargain, indeed, is infrequent transportation service, manual switching and wall receivers for telephone equipment, and less assurance of continuous electric service. And if the close relationship of pricing and output conditions is recognized, the service ratings of small rural companies can be fully as high as the ratings of large urban companies.

EXTENSIONS

A broad policy for output control extends to the distribution as well as the expansion of service consumption. Such a policy is concerned not only with new limits of service consumption, but also with service distribution between different customers and different uses. The present output regulation is not so extensive. Commissions concentrate attention on service expansion that is controlled both by the companies' legal obligations to make extensions and by their willingness to make investments. And the distribution problem, neglected by the commissions, is solved by the companies. This private solution commonly takes the form of price differentiation (which is discussed in later chapters) between customers and service uses. Charging some customers higher prices than others, the companies clearly manipulate the allocations of available outputs. Price differentiation affects the distribution of natural gas, for instance, between manufacturing, cooking, water-heating, and space-heating uses. Until the supply of utility services is fixed or even is decreasing, or until regulators have more interest in the social effects of price differentiation, the distribution of service is not likely to be a significant regulatory fact.*

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* A special kind of distribution problem arises now and then: if a state has large natural gas fields, it may want to save the gas for its own industrial growth and to limit gas shipments to other states.[6] This political view of natural gas distribution is evident in Louisiana, Texas, and Kansas where there are large gas reserves and limited amounts of heavy industry. These states want more manufacturing, even if goods can be produced more cheaply elsewhere.

Commissions simply do not yet feel compelled to deal intensively with output distribution. Just as the whole American populace seems to be more concerned with a larger national income or a larger national production than with a better distribution of income and consumption, so the utility regulators emphasize the expansion of utility service.

The limits of service expansion often are prescribed in a company's franchise or certificate of convenience and necessity. This is the legal limit of extensions. There is also an economic limit of extensions, a limit that is determined by the demands for service and the techniques of producing it. Technical changes in pipe-line construction, for instance, widened the limits of natural gas service. But improvements in the automobile nearly ruined the street railway industry and permitted, at the same time, the substitution of busses for streetcars. Furthermore, there were frequent increases in demand, either because the population increased or because the output unit and appliances were improved, more consumers were attracted, and the limits of electric, gas, water, and telephone services were extended. But one kind of utility service expanded sometimes at the expense of another. Buyers substituted electricity for gas, or shifted from telegrams to telephone calls.

Holding Out to Serve. Following the customs of utility regulation, a company is expected to serve all who ask for service within the area where the company holds itself out to serve. These market limits usually are defined by the city's franchise or the commission's certificate, though the service responsibilities sometimes are determined by the general conduct of the company. When the service obligations of a company are controlled by franchise provisions, the obligations commonly cease as soon as the franchise expires. After the franchise is terminated, the firm may think that it can abandon operations or refuse service to new customers.[7] But a commission does not always accept a franchise as the final basis for service obligations. Going beyond the rights and duties defined in a franchise or a sales contract, the commission can hold that the expiration of the buyer contract or a franchise does not permit a company to abandon or withhold service.[8] At any rate, the general rule of service extensions, based either on the franchise or on the public utility status of companies, is quite explicit: if the utility firm decides to serve one buyer in a certain way, it must stand ready to serve all similar buyers in the same manner. In the early years of regulation the Supreme Court said that

> Corporations which devote their property to a public use may not pick and choose, serving only the portions of the territory covered by their franchises which it is presently profitable for them to serve, and restricting the develop-

ment of the remaining portions by leaving their inhabitants in discomfort without the service which they alone can render.[9]

Sometimes companies thought that their franchises were not applicable beyond the defined areas of service. Perhaps the franchise was issued when the city was small. Thus some of the expanding city did not come within the legal limits that were prescribed for the company's service. Yet, if a reasonable or common-sense interpretation of the franchises prevailed, there could scarcely be any doubt that the private firms were holding themselves out to serve the whole expanding market. Most utility companies were not forced, of course, to make service extensions as cities grew. They were willing to exploit the growing markets. A few firms wished to serve only parts of the new urban areas. But commissions commonly did not allow them to "pick and choose" customers in the expanding service area; companies were required to extend service throughout the expanding cities.[10]

Another question is the extension of service to rival companies. Municipal electric plants sometimes buy electricity from private systems. The Wisconsin Commission holds that, despite the competitive relationship of private and municipal plants, the private companies can be compelled to provide wholesale electric service for the municipal plants.[11] Wholesale service is public utility business in Wisconsin.[12] But a different rule commonly is applicable to competition between rival private companies: most commissions do not require a company to serve a rival firm.[13] When more than one electric, gas, water, transportation, or telephone company occupies a market, none of the rival producers of a service are expected to serve each other regularly. One electric company, for instance, is not required to make up the deficiencies in productive capacity of a rival firm. The New York Commission even holds that the leased wire service of the Bell system—a special utility service for broker systems, teletypewriters, transmission of radio programs by wire, and other uses—can be withheld from companies that have their own communication systems.[14]

Both the companies and the commissions consider prospective revenue, costs, and earnings as successive extensions are contemplated in a market area. A utility company may be holding out to serve a city or region. This does not mean that any buyer, regardless of his location, is assured service. Before companies are ordered to extend their lines, commissions consider the evidence on the prospective earnings from the extensions. Commissions do not expect a firm to obtain the same rate of return from each market section; an urban transportation company, for instance, may lose money on some routes and in some outlying areas.

Even if the total earnings of a firm are supposed to be reasonable, each service extension is not supposed to be self-supporting.[15] Yet commissions do consider the effect of new extensions on the total return of a company. Consequently, when the prospective expenditures are high relative to the prospective revenue, an extension is not always ordered.[16]

There are further reasons why a utility company is not compelled to serve all the persons who want service. A firm has a right to expect payment for its service; when a consumer does not pay his bills, utility service can be discontinued.[17] If the buyer steals service, the company is not required to serve him.[18] When the service is used for an illegal purpose, it can be withheld. Telephone systems, for example, refuse local, long-distance, and leased-wire service to the "bookmaking" organizations in horse racing and to the distributors of race-track news.[19] Sometimes, too, a company withholds service unless the appliances and the electric wiring meet certain technical specifications.[20]

Submetering. A special question of the buyer's right to service arises when he buys service through one meter and sells it to other persons through several meters. This practice is called "submetering." Such buying and reselling of service, which is practiced principally by the owners of apartment houses and office buildings, gives the submeterer some profits. He buys at a lower average price than the price at which he sells the same service.* At one time the electric companies wanted submetering customers. When office and apartment buildings had separate electric plants, the electric systems offered submetering privileges to the building owners. Eliminating small, one-building electric plants, the companies increased their sales. But today the utility firms, except for hotel telephone service,[21] are not interested in submetering customers.

Most commissions do not approve the submetering of electric and gas service. Even though the owners of office and apartment buildings offer strong objections and claim a private right to use service as they please, companies can withhold service from a submetering firm or person.[22] In these states the submeterer is not a buyer to whom companies must hold out service. But the New York Commission, confronted by more submetering than any other commission, does not try to prohibit it. It says that it does not approve of submetering.[23] Yet, because submetering is a common practice in New York City, the commission apparently feels compelled to condone it. And New York gas and electric companies must make service extensions to submeterers. As the matter stands now, the New York Commission seeks direct regulation of submetering rather than the eradication of it.[24]

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* Even if the submeterer buys at the same price schedule that is used for all final consumers, he still can make a profit. Let us suppose that the utility company has a "block" price schedule; the prices decrease as successive increments of service are bought. Buying service for a group of consumers, the submeterer extends his purchases into the low-price blocks. Although he sells service according to the same price schedule at which he buys, he makes more sales in the high-price blocks than he purchases in these blocks. His total revenue exceeds his total cost even if he is not favored with a special wholesale rate. Taking advantage of a discriminatory price schedule (this kind of discrimination is explained in Chap. 28), the submeterer makes a profit.

"New" Extensions. Within the market area of a company and the established uses of service—which are defined by the franchise, the certificate of convenience and necessity, and past company practices—the "holding-out" rule is the most important determinant of service extensions. If a firm has the right to occupy a market, it must serve all or nearly all the available buyers in the market. If a company sells a certain kind of service to some buyers, it must sell the same service to similar consumers who have similar locations. But a different legal standard is applicable to other extensions. When lines are extended beyond the present market limits and when new uses of service are developed, the managers and directors usually control the extensions. In the "new" service areas the prospective earnings, which are measured by the managers, are the primary consideration of service enlargements. The company tries to make profitable investment decisions. But after the service is well established in a new area, the commission can force further extensions and can require new plant investments. Investment conditions are the main determinants of market expansion; legal obligations are the principal controls in an old or established market area.

Although new extensions usually are controlled by private companies, commissions order extensions into new territory now and then.* Only two cases about these new lines and new markets were decided by the Supreme Court. In one case the Court approved a commission order for an extension; in the other case the commission order was not approved. The New York Commission ordered a gas company to extend service to communities that were adjacent to the city where the firm provided service. Giving attention primarily to the prospective revenue and expenditures, the Supreme Court thought that the extension was a reasonable requirement. But the Court warned that

> Under the guise of regulation, the state may not require the company to make large expenditures for the extension of its mains and service into new terri-

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* Some commissions do not have statutory authority to order extensions into new market areas. One such case is federal control of natural gas extensions. Guided by the holding-out rule, Congress restricts regulatory control of the pipe-line extensions of interstate natural gas companies. The Federal Power Commission can order extensions to communities that are "immediately adjacent" to a transmission line, or "to territory served" by a transmission company.[25] Where the gas-transmission companies are holding out service, the Power Commission can order extensions. But beyond this limit Congress does not grant regulatory authority to the commission.

tory when the necessary result will be to compel the company to use its property for the public convenience without just compensation.[26]

The other Supreme Court decision dealt with a long extension of a steam railroad line. When the Transportation Act was passed in 1920, the Interstate Commerce Commission was authorized to require a railroad company ". . . to provide itself with safe and adequate facilities for . . . car service . . . , and to extend its line or lines." Exercising this statutory authority, the commission ordered a railroad company to make a 190-mile extension in Oregon that would cost about $9,000,000. The Supreme Court did not uphold the commission; the Court believed, indeed, that the commission's authority did not ". . . embrace the building of what is essentially a new line to reach new territory."[27] Looking at the Congressional statute, the Court said,

> We should expect, if Congress were intending to grant to the Commission a new and drastic power to compel the investment of enormous sums for the . . . service of a region which the carrier had never theretofore entered or intended to serve, the intention would be exprssed in more than a clause in a sentence dealing with car service.[28]

Economic Conditions of Extensions. Unless utility companies make new-plant investments, they cannot extend their lines into new market areas. Perhaps a bus system can transfer equipment from old routes and not incur additional investments. But electric, gas, telephone, water, and street railway companies must invest in new service lines; some of them may invest, too, in basic equipment such as electric-generating stations or water-pumping stations. The conditions of investment decisions control, therefore, the managerial plans for market expansion. The investment equation, which consists of revenue and cost expectations on one side and the current or prospective cost of capital on the other side, determines the amount and the limit of new service extensions. As long as the net earnings are expected to increase, the company is willing to expand its plant. But no company wants to extend operations beyond the point where the expected increment in earnings (the difference between expected revenue and expected operating cost) exceeds the cost of borrowing funds.

Some revenue and cost conditions of new-extension investments are graphically described in Figure 10. The marginal-cost (*MC*) and average-cost (*AC*) curves express the cost effects that follow from new service extensions. A uniform service price, P_1, is assumed for the new market, because utility companies are expected to charge the same prices to buyers who have similar locations and are in the same service classification. Given these simple conditions, the company can maximize the net earn-

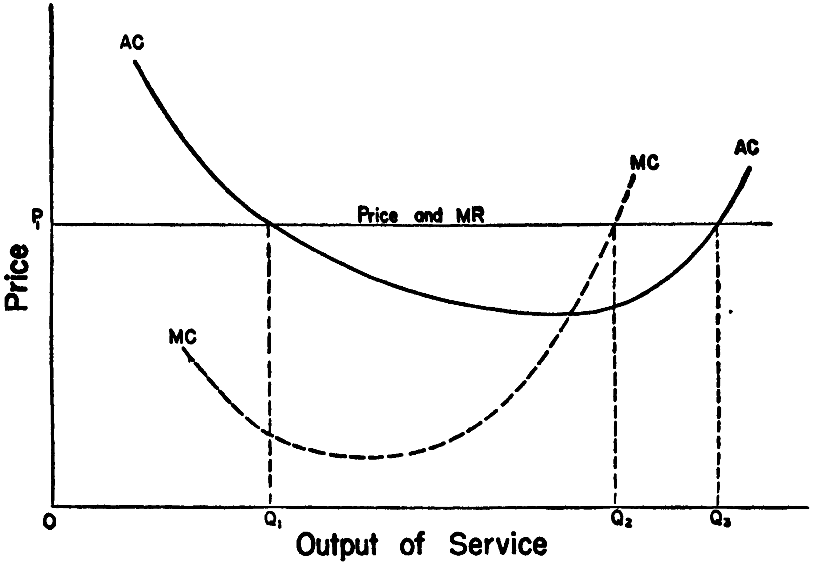

FIG. 10.

ings when it produces an OQ_2 amount of service. This amount of output is measured by the point where marginal cost is equal to marginal revenue (*MR*). When, as in Figure 10, the price is uniform for all units of service, the price line (P_1) is, of course, the marginal-revenue line too. Thus, when the price is given, the monopoly output is determined by an equation of the marginal revenue, the price, and the marginal service cost.

Cost data are nicely laid out in Figure 10. Using these data, a company can see that the profitable limits of output expansion are between OQ_1 and OQ_3. And it can see, too, that shifts in the *AC* and *MC* curves affect the monopoly profits in the new market. If the costs are lower for all output units than in Figure 10 (i.e., if the *MC* and *AC* curves are to the right of their present positions), the monopoly output is larger than OQ_2. If the costs are higher, however, for all output units than they are assumed to be in Figure 10, then something less than OQ_2 is most profitably produced at the P_1 price.

When an extension into a new market area is contemplated, the managers do not have complete cost information. Considering only the current cost conditions, they do not have enough information for the average cost and marginal cost to be computed for each successive output unit. Company managers and rate engineers can estimate large cost increments for large additions to the total output, but they do not have such long and smooth cost curves as AC and MC in Figure 10. And the future operating costs are uncertainties. Wages, raw material prices, plant-maintenance expenditures, and taxes can vary, because general business and political conditions are not stable. Entering a new market before they know everything about production costs, managers can measure an anticipated monopoly output and draw up plant expansion and plant investment plans according to their anticipations. Yet the anticipated monopoly output at the P_1 price is not the real monopoly output at the price. Until the market extension is made and the cost conditions are experienced, the firm does not know just what the most profitable output at the P_1 price is.

There is a further uncertainty: the consumer demand in the new market is not fully known. How much service will the new-extension buyers take at a price of P_1? If there is a demand for OQ_1 or less units at the P_1 price, then the new extension cannot be justified. Perhaps the demand is expected to increase after the extension is made. Even so, the company does not build the extension unless it anticipates that the future buyers are willing to take more than an OQ_1 quantity of service at the P_1 price. The firm cannot afford to make the extension unless P_1 is equal to or greater than AC—unless the increment in total revenue is expected to equal or to exceed the cost increment that includes the increment in capital costs. Likewise, according to the facts of Figure 10, the company cannot afford the extension when the buyers want more than OQ_3 units at P_1. If the buyers are expected to purchase more than OQ_1 and less than OQ_3 units of service at the P_1 price, the company is willing to invest in the extension. Planning to sell service at P_1 and anticipating an output between OQ_1 and OQ_3, the firm can afford the extension investment because the revenue increment exceeds the cost increment.

A peculiar uncertainty of earnings is associated with new market extensions of utility service. A company cannot "pick and choose" buyers, trying to make the most profitable extension of service. Unlike a private company, the utility firm must serve everyone in the new market who demands service. And after a utility company enters a new market, it cannot withdraw from the market whenever the business becomes unattractive. It has a responsibility to continue service until the commission approves an abandonment. Entering a new market, the firm acquires present obligations as well as unknown future obligations of service performance. Consequently the wise manager must look far ahead, trying to discern what effects the service obligations may have on future earnings. A small current increment in earnings may not induce the managers to take on large, permanent service obligations. These managers want to foresee a substantial future demand for service; looking into the future, they may want to see good earnings prospects for twenty or twenty-five years. Otherwise they probably are satisfied with the current earnings and the established markets.

Obligated to serve everyone in the new market and subjected to price regulation, a utility company cannot control the monopoly output and monopoly price so that the profits are maximized. Unlike a private monopolist, the company cannot manipulate prices, select customers, and determine exactly the output. Held to the P_1 price of Figure 10, the utility firm produces whatever service the buyers demand in the new market. A profit-maximizing output still is possible. When the buyers want OQ_2 quantity of service at P_1, the monopoly output is produced. This output is a coincidental result of demand and cost behavior, not a consequence of managerial control. Buyers are likely to demand more or less than OQ_2 at the P_1 price. If the buyers demand more than OQ_2 units of service at P_1, the company must satisfy all the demands after it makes the extension. When the firm operates under increasing cost conditions, the earnings from an extension decline as the output increases beyond OQ_2. At an OQ_3 output the company breaks even, getting just enough total revenue to cover the total cost of the new service. If everyone must be served and losses are incurred as output is extended beyond OQ_3 units of service, investments are likely to be withheld from the extension. Under special conditions the company is willing to build the extension and incur the loss. Some money-losing extensions are built to appease buyers, or to keep another firm, public plant, or cooperative association out of the new market.

Relation to Earnings Control. Utility commissions, which rarely study the earnings expectations and investment decisions of utility companies, do not examine the opportunities for market expansion. Development of new markets is in the hands of company managers. Commissions have a narrow, historical view rather than a broad, foresighted view of output problems. Commissions do not develop a regulatory relationship between earnings (or price) control and output control, but concentrate on price and earnings control within the output limits established by the utility companies. A larger view of earnings control can be taken. Prices and output can become two related dimensions of the same question. Since the buyer demand obviously has price-quantity functions and since companies try to control their earnings according to both prices and sales, regulators can tie earnings controls and output controls together.

Commissions must accept the legal fact that the utility companies are free to determine most investments beyond the holding-out area. Like other capitalistic organizations, utility firms cannot be forced to make *any* amount of investment in new markets. The Supreme Court may approve some commission orders that require sizable extensions of the market limits. But the Court surely is unwilling to approve investments that impair the financial standings of companies. Yet, even if private firms cannot be forced to make many of these investments, perhaps they can be induced to make them. Commissions can study new markets for service, the earnings expectations of utility companies, and ways to attract new investments and to extend the limits of service.

Commissions can induce market developments in several ways. One way is differential pricing. Higher prices can be charged in the new markets than are charged in the established markets. A company is not willing, let us suppose, to expand into a new use area or new territorial area at the prevailing prices. It does not anticipate an increment in total revenue that is as large as the expected increment in total cost. These anticipations do not justify an investment in the service extension. But when the company is allowed higher prices in the new service area and anticipates more revenue and earnings, it may be willing to build the plant extension. Commissions approve some price differentials between service areas. Providing service between the hub city and suburban areas, bus lines commonly charge higher prices than the lines operating within the main city. And private electric companies sometimes are allowed to charge higher prices for rural service than for the adjacent urban service.[29]

Using another inducement for new extensions, the commissions can increase the prices for *all* buyers. The cost of extensions is not assigned directly to the consumers who use them. Instead, all the operations, including the new service, are lumped together for pricing purposes. Public authorities can argue, of course, that the limits of the market are not confined to the section that the company develops. Just as each single buyer is not the object of separate cost determinations, so a certain part of a city or region need not be marked off for separate cost calculations and price determinations. According to this view the "hub" should support the "fringe." But this social proposition is not acceptable to the old buyers and most commissioners. The existing customers of a firm do not believe that they are responsible for the total or regional development of service. If they can be served cheaply because their area is easy to serve, they want low prices. And they certainly object to price increases that allow more persons to get service. The old buyers do not want to pay the costs of new-buyer service. And the utility commissioners, who naturally have a political respect for consumer views, are not likely to raise all prices, and spread the new service costs among all buyers.

Excess earnings, too, can be used to finance the extensions of service. When the anticipated revenue does not equal the anticipated cost of a new extension, a commission can use the excess earnings of a company to cover the deficiencies in new-extension earnings.* The rate reductions of existing buyers are given up so that utility service is available to more consumers or new uses. To induce investments in new service extensions, commissioners probably prefer transfers of excess earnings to general price increases. Customers are sure to object to general price increases that are designed to extend the limits of service. Yet they may not oppose the use of excess earnings for the same purpose, even if the price effect of this policy is equal to the price increase of the alternative policy. Consumers can feel the effect of the price increases; and they object to them. But when they forego a price reduction, they give up something they do not have. Most consumers may not even know, indeed, that some of the excess earnings are used to finance extensions.

If commissions ever withhold price reductions and use the excess earnings for a market expansion program, they must be assured that the companies are willing to undertake the extensions. The choice between price reductions and service extensions cannot be left to the companies. If the companies are given such a choice, they may withhold both the price reductions and investments in new markets. The regulators can make bargains with the utility firms; they can order a firm either to make the extension or to accept a price reduction. When earnings and output regulation are brought together in this manner, the commissions must do more than measure the excess earnings. To determine how much excess earnings should be used for market expansion, they study the prospective demand and cost conditions in the new market areas, and examine the earnings expectations of the companies. Commissions do something out of the ordinary: they consider the conditions of investment decisions.

ABANDONMENTS

Discontinuance of utility service has been a minor regulatory problem. Steam railway lines have been abandoned in every section of the country. And street railways have been discarded in many small and medium-sized cities. But elsewhere the commissions have dealt, for the most part, with expanding industries; they have dealt with maturing and dynamic companies, not old and static enterprises. Commissions have functioned, so far, in an environment where many new investments in public utility plants, rapid growth of cities, and important technical innovations have been common. During the twentieth century a noteworthy expansion occurred in the telephone and electric industries. And gas and water companies continued to expand after 1900, because American cities continued to grow. But this expansion of gas, water, telephone, and electric industries will not go on forever. Before the twentieth century ends, many flourishing utility companies probably will stop expanding; some may be decadent. Given time, commissions will face far more petitions for partial or complete abandonments of utility operations than they have encountered in past years.

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* A company also can voluntarily plan to pay the new-extension deficits out of excess earnings. Private electric firms, for example, were forced to build rural lines rapidly after 1935 because the Rural Electrification Administration was ready to organize and finance cooperative systems. To hold their adjacent rural markets and to avoid the rivalry of cooperative service, the companies probably built some lines on which they expected to lose money. These losses could be covered sometimes by excessive returns that otherwise were turned into rate reductions for urban customers.

Even though they have only limited experience with abandonment problems, regulators commonly take a greater interest in service abandonments than in enlargements of output. They do not leave abandonments to the discretion of utility-company managers. Sometimes the commissioners have no choice of alternatives: they must accept the proposed abandonments. But when they do have choices between abandonments and continuations of service, they are slow, even too slow sometimes, to permit the abandonments. They try to protect the consumers against losses of service. Unlike a new extension of service, an abandonment of service takes away something that the consumers have. When utility service stops, some consumers lose an indispensable service or are forced to shift to more costly alternatives. Thinking of consumers rather than investors, commissions hold back abandonments. Even if elimination of unprofitable lines and market areas is the only way to get reasonable returns, commissions do not like to approve the abandonments. They, like Micawber, apparently believe that something will turn up before everything is lost. Commissioners are prone to hold established limits of service until all conceivable alternatives to abandonments are exhausted.

As the term "abandonment" is used by commissioners, it usually has a technical or legal meaning rather than an economic meaning. The regulator often makes a distinction between a reduction in output and an abandonment. Defined according to commission practices, an abandonment is the cessation of all or a large part of the operations of a utility company. A reduction of output, on the other hand, apparently is associated with a decline in buyer consumption; it is a result of a demand change over which the commission has no control. Either a reduction in output or an abandonment involves a contraction of operations; both are reductions of output. But in the minds of regulators a "reduction of output" is an act of the consumers, while an "abandonment" is an act of the utility firm. The consumers have no obligation to buy; the company, on the contrary, has an obligation to sell. Until an abandonment seems to be a necessary social change and can be defended with convincing evidence, it is considered a violation of the obligation to serve all who come.

The Private Firm's Choice. Utility companies do not like to admit that they must abandon part or all of their operations sometime. A firm does not want to abandon part of its plant as soon as the total costs are larger than the total revenue; it asks for an abandonment only when no more of the plant investment can be recovered. Operations are continued until, as the company looks ahead, the prospective revenue is less than the prospective expenditures. Unlike unregulated firms, utility companies cannot freely adjust prices and sales to minimize their deficits. The prices are fixed by the commissions; and the amount of service, which usually is small as the time of abandonment approaches, is controlled by the holding-out rule. Even if the company wants to minimize the deficits, it must accept the price and service requirements of the regulators. Despite the public restrictions, the firm still tries to maximize the difference between the expected expenditures and expected revenue. Doing this, it is retrieving part of its investment, even though it is incurring deficits all the time. To reduce expenditures, it defers plant-maintenance expenditures. Although the service of utility firms may not quickly reflect the deferred maintenance because the utility plants last a long time, deterioration of the quality of service cannot be avoided forever. Sometime there must be a choice between an abandonment of operations and large new investments in equipment. Then the day of abandonment is at hand.

Figure 11 describes the pricing problem of a firm that is trying to retrieve part of its past investment. The regulatory agency, let us assume, requires the company to sell at a price (or a price level) of P_1. When the demand is D_2, P_1 is a profitable price. The price line P_1 intersects the demand curve D_2 at a point that is above the average total cost of service—above the *ATC* curve that takes account of the depreciation, maintenance, and capital costs for the existing plant. When the demand decreases to the D_1 position, the price, P_1, is unprofitable; the intersection of P_1 and D_1 is below the *ATC* curve. Unless the demand increases, the company eventually should abandon the plant.

The company, meanwhile, can afford to sell at the P_1 price, because it recovers a part of the depreciation, maintenance, and interest costs. The retrieval of these costs—which is the same thing as the retrieval of the plant investment—is shown by the fact that P_1 is higher than the average variable cost (*AVC*) of service. When the demand is D_1 and the price is P_1, buyers are willing to take OQ_1 units of service. The *AVC* curve is below the P_1 line at OQ_1. In time the variable costs increase,

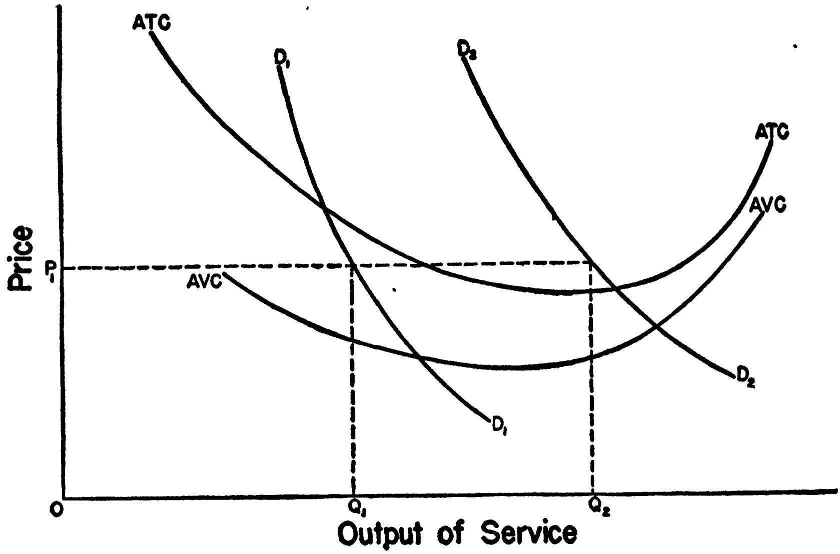

FIG. 11.

because the company must replace and repair larger and larger parts of the plant. And the demand may continue to decrease. If either or both of these changes occur, the time of abandonment is drawing near. When the average variable cost is above and promises to remain above the price of service, the firm cannot retrieve any more of its past investment. Then it asks for the right to abandon operations.

Regulatory and Judicial Views. A commission cannot do anything to prevent an abandonment if the company, worn down by years of deferred maintenance of its equipment, chooses to abandon all its operations.[30] Continuation of operations requires either an investment in new equipment or a restoration of the existing equipment. Investors do not lend funds to a company that cannot earn some return on the investments and recover the depreciation costs. The commission, consequently, is compelled to approve the abandonment of all operations. When a commission grants an abandonment order under these conditions, it is simply keeping the regulatory records straight. As the Supreme Court said in the Eastern Texas case that concerned a railroad abandonment,* a utility company devotes its property to public service

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* Several of the leading Supreme Court opinions on abandonments concern steam railroad lines that are not directly under discussion in this book. These opinions are presented here because they indicate legal attitudes toward public utility abandonments in general; they suggest what the electric and telephone industries, for instance, could expect if they were in the decadent stage of their lives and were trying to economize by changing the margins of operations.

> . . . on condition that the public shall supply sufficient traffic on a reasonable rate basis to yield a fair return. And if at any time it develops with reasonable certainty that future operation must be at a loss, the company may discontinue operation and get what it can out of the property by dismantling the road.[31]

Nor does a commission have alternative choices when the supply of utility service is exhausted. Natural gas service affords examples of this sort of abandonment condition. When a natural gas field is exhausted, the commission cannot refuse the company's request to abandon service.[32] Neither the company nor the commission is able to replace the consumed gas. Only investments in another gas field can save the natural gas service. And these investments are controlled by private managers rather than the commission.

But when a "partial" abandonment is proposed, a commission can assert its authority and choose between abandonment and continuation of service. A partial abandonment involves a withdrawal of only part of the firm's operations. A street railway company wants to reduce the number of routes or the frequency of service, a gas firm asks permission to abandon rather than repair certain gas mains, a telephone system requests an abandonment of a poorly patronized and expensive farm line, or an electric company wishes to abandon one of its distribution lines. In these situations the commission retains authority over the remainder of the system. Using its control over the whole system, the commission can force a company to continue the operation of unprofitable segments of the system.[33]

Confronting a partial abandonment case, the commission must choose between the opposing arguments of buying and selling interests. Even if they are not compelled to buy service and even if decreases in the demand for service are undeniable, the buyers insist that the company should perform its "duty." On this side the service obligations of the firm, which are recorded in the franchise or the commission certificate or the general concept of holding out to serve, are the usual arguments for the continuation of service. Trying to obtain approval of an abandonment, the company tells about the financial losses of continued operations, and explains the effect that the losses can have on the future service performance of the firm. A commission is likely to be on the side of buyers, who are threatened with an immediate loss of utility service, rather than the side of the company which does not lose its plant immediately. Thus the regulators, seeking a simple solution, attach considerable importance to the written or implied obligations of the firm, particularly the requirement to serve all who come within the area where the company holds itself out to serve.

The Supreme Court considered partial abandonments in several cases. A distinction was drawn between complete and partial abandonments. When the case involved a partial abandonment, the legal obligations of the utility firm apparently were the most important consideration. In the Fort Smith case a street railway company asked for the right to abandon less than one mile of its twenty-two miles of lines because, as a result of street improvements, an additional investment of $10,000 would be necessary for the one-mile line. Along the one-mile line the daily expenditures were four times as large as the daily revenue,[84] and the company earned less than 2 per cent on the "estimated value" of the whole property. Supporting the city's strict interpretation of the company's franchise obligations, the Supreme Court decided that

> A public utility cannot, because of loss, escape obligations voluntarily assumed. . . . This is true even where the system as a whole fails to earn a fair return upon the value of the property. So far as appears, this company is at liberty to surrender its franchise and discontinue operations throughout the city.[85]

The Court ignored the deficits. And it was indifferent to the effect the franchise obligations could have on the possible future abandonment of the entire street railway.

When the abandonment of a branch railroad line in Colorado was considered a year later, the Supreme Court was more observant of the earnings effects of the abandonment than it was in the Ft. Smith case. Approving an abandonment that seemed to interfere with profitable interstate operations of the company, the Court said,

> Expenditures in the local interest may be so large as to compel the carrier to raise reasonable interstate rates, or to abstain from making an appropriate reduction of such rates, or to curtail interstate service. . . . Likewise, excessive local expenditures may so weaken the financial condition of the carrier as to raise the cost of securing capital . . . , and thus compel an increase in rates.[86]

The Court considered the effect that a partial abandonment of operations could have on the total operations of the company. Judicial attention was focused on the aggregate future service and future rate reductions, not the continuation of all old services.

In a later case, however, the Supreme Court followed the reasoning of the Ft. Smith case rather than the reasoning of the Colorado case. A company held a consolidated franchise in the Broad River case, and had the right to perform gas, electric, and street railway service in a city.[87] According to the company's evidence, the street railway service was unprofitable (though the Court did not find conclusive evidence of the losses) and the firm wished, consequently, to abandon street railway operations. Four justices voted for abandonment of street railway service, and four voted for its continuation. But the members of the Court agreed on a dismissal of the case, giving approval thereby to the continuation of street railway operations. Chief Justice Hughes and three "liberal" justices—Justices Holmes, Brandeis, and Stone—believed that the company had a choice between all or none of the consolidated franchise. In the Court's opinion, which Justice Stone wrote, emphasis was put on the "duties and obligations" of the firm. Following the doctrine of strict construction, the Court resolved the ambiguities of the franchise "in favor of the public service." *

An Abandonment Policy. An important fact in an abandonment case is the adequacy or inadequacy of the total earnings of the company. If these are barely reasonable or slightly less than reasonable, then the denial of an abandonment can impair the service of the whole system. The company is willing, perhaps, to make some new investments. But, since the earnings condition is not attractive to the managers or to the investors, the company has a cautious financial policy. The managers want to be sure that they have enough earnings for interest and preferred-dividend payments. There are no "extra" earnings that can be risked in new operations and innovation investments. On a utility company a deficiency of earnings is likely to have the same effect that a persistent loss of chips has on a card player: the firm makes conservative estimates of future earnings, and does not make new plant investments unless the risks seem to be low. And after a commission forces a company to continue unprofitable operations, the investors may decide that the old and new securities have a higher risk of default. If they lend their funds to the system, they want higher rates of interest than the company pays on outstanding bonds and notes. So, if a commission's abandonment policy creates or accentuates a deficit condition for a utility system, it can limit the expansion and improvement of service.

When the abandonment policy presses the earnings of a company below a reasonable level, the quality of service begins to deteriorate. The managers begin to shift attention from new investments to the recovery of old investments. Desiring to retrieve the largest possible amount of the past investments, the managers pare expenditures wherever they can. Expenditures on plant maintenance are certain to be reduced; repairs are skimpy and plant replacements are put off as long as possible. Interest payments must be met, wage rates do not decrease just because the company incurs deficits, and raw material costs (e.g., the electricity purchased by a street railway company) do not decline much; but the expenditures for replacements, repairs, and general plant maintenance decrease sharply. Since the firm necessarily is looking toward a general abandonment of operations if the deficits continue, the expenditures on the plant must decline. In time the deferred maintenance begins to show up in the quality of service. If a street railway company, for instance, is in a decadent financial condition, the tracks become rougher, equipment breaks down frequently, and no new cars or other equipment are bought. Someday the whole system is abandoned; everyone loses the utility service. Is it not better to abandon a part of the company's operations than to lose everything?

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* Nevertheless, several commissions have approved partial abandonments. One commission thought that a company "must be allowed to abandon the line [a rural electric line] unless the customers are willing to pay the proper rates. . . ." [38] Another commission did not make a telephone company continue service for summer customers "in view of a continuing financial loss." [39] Two commissions allowed electric companies to abandon steam-heating service, because a reasonable return was not being earned.[40] And, despite franchise requirements, other commissions approved partial abandonments of urban transportation systems.[41]

When the company has at least reasonable earnings without an abandonment and excessive earnings with an abandonment, a different public policy can be adopted. The excessive earnings of a utility firm can be used to maintain the existing limits of service, just as they can be used to induce new investments in service extensions. Customers in the most profitable segments of a system forego rate reductions so that customers in the least profitable segments can be served. This use of excessive earnings can be justified. A whole city or a region is really a good social unit for output and price control. A city issues a franchise or a state commission grants a certificate to a company so that a whole area, rather than selected persons, can buy utility service. When public authorities allow a company to occupy a public utility market, they expect the firm to serve both its profitable and unprofitable segments. The short riders of a bus system, those who live within the "hub" of a city, can be hauled more cheaply than the riders who are transported to the fringe of the city. But the transportation of both long and short riders is a service obligation of the utility company.

At times a rate reduction for many buyers can be preferable to service maintenance for a few buyers. If a number of outlying bus routes serve only a few families on each route, these routes can be eliminated so that lower prices or more busses and more seats can be provided for the mass of consumers. A rural telephone line, poorly patronized and expensive to maintain, might also be abandoned so that excess earnings can be used to reduce prices elsewhere. When the excessive earnings of one utility service are used to cover the deficits of another, a strong case can be built up for an abandonment. Take the case of a company that performs both electric and street railway service. Following the facts of the Broad River case, let us suppose that the company earns excessive returns from electric operations and incurs deficits from street railway service. If the excessive electricity earnings are used to cover deficiencies in street railway earnings, the electricity customers forego price reductions. Some of the electricity consumers infrequently use the street railway service that they support. Defending the interutility transfer of earnings, the city or commission can argue that a local enterprise is preserved. But if the street railway is so essential to civic affairs, why not sustain it with tax revenue rather than electricity revenue? At any rate, the community foregoes an increase in electricity consumption when the excessive electric earnings are not used to reduce the electricity prices. Additional consumption of one service is foregone so that the output of another and outmoded service can be maintained.

The regulatory policy for abandonments can have a bearing on the earnings expectations of utility companies, and can affect the investment decisions of the firms. This is true even if the companies earn at least a reasonable return. Forcing systems to maintain the established limits of service or delaying plant abandonments in unprofitable parts of a market, a commission can discourage the expansion of service limits. When firms consider extensions into new geographic or use areas, they can act cautiously, being aware that any extension is accompanied by enduring obligations to maintain the established limits of operations. A stiff regulatory policy for abandonments is a special.risk for investors. Yet, when utility companies expanded rapidly, their managers apparently did not worry about the future regulatory control of plant abandonments. They sought new business and more earnings, and left the future service obligations to another generation of financiers and managers. But when the expansion of utility firms dwindles away and when improvements and demand enlargements appear less frequently and do not compensate for past managerial errors, managers and directors may give more attention to abandonment policies. After the presently maturing firms cannot foresee future increases in earnings, they may give more attention to current operating economies. Then the deficits of some operations, such as a poorly patronized transportation route or a high-cost electric line for farm customers, means more to the managers. Considering the conditions of investment decisions, commissions should remember that the historical limits of service are not always the best limits of service. A flexible rather than a rigid concept of the holding-out obligation can best serve the public interest.

Chapter 22

Rural Electrification

FOR MANY years the farms of the country were the big, untapped market for electricity. About thirty million persons, a quarter of the nation's population, lived on farms in 1930. Yet long after electricity was put to many industrial and domestic uses and long after transmission lines first brought electricity to many rural towns, most farm families did not have electric service. Other rural inhabitants, living in crossroad villages and operating filling stations or other businesses along the roads, often lacked electric service, too. Next to all-weather roads, these people wanted low-priced electricity; the rural family, desiring the conveniences of urban life, wanted electrically lighted buildings, electric refrigerators, and numerous other appliances. There was a notable private limitation of the electric extensions: they were expensive relative to the prospective revenue. So the private electric companies, which controlled rural electric service before 1935, did not build many rural lines. But after 1935 the federal government became a new force in rural electrification, furnishing funds and management and bringing electricity to many farms and villages. Stimulated by the new national policy, the growth of rural electrification was rapid.

PRIVATE COMPANY SERVICE BEFORE 1935

Even when their other markets expanded rapidly, the private electric companies were not indifferent to farm electrification. They knew that the farms were a large potential market for electricity. But before they built rural electric lines, they wanted to be quite sure of additional earnings from rural service. These private companies were willing to build rural lines only when they anticipated earnings increments—only when the revenue increment from another line was expected to be larger than the cost increment for the line. To study demand and cost conditions of rural electrification and to promote rural service, the private electric industry organized national and state committees.[1] One problem was reduction of the investment costs of distribution lines; as late as 1930 the investment costs still ranged from $1,200 to $2,000 for a mile of line, and private companies apparently did not try very hard to reduce the costs. Another problem was the rural demand for electricity, particularly the stimulation of demand increases. Managers of private companies wanted to make sales for more than lighting and household-appliance service. As long as the line investment for the average customer was high, some company managers were convinced that widespread farm electrification was dependent on power uses of electricity. Electric motors could be used, of course, on all farms. Farm uses of electricity were studied, research on farm electric equipment was sponsored, and selling campaigns were undertaken to enlarge the farm uses of electricity. Yet the private companies did not create much new demand for farm electric service.

The Investment Rules. As farm electric service expanded slowly before 1935, the private companies usually "skimmed the cream" from the rural electric markets. They built lines where they expected increments in net earnings—where the farms were concentrated, where high farm incomes or a large power consumption promised large sales, and where the terrain afforded economies of construction costs. Private companies did not extend much service to farmers who had low incomes, wanted to use electricity primarily for lighting purposes, and lived on scattered or isolated farms. And trying to protect their earnings from the rural business, the private companies fixed high minimum bills for service. They wanted a profitable business, not widespread service. Companies picked groups of customers here and there, and did not blanket whole counties with electric lines. This was a private, monopolistic standard of service expansion that was controlled by conservative prospects of demand conditions and additional earnings.

The financial requirements of rural line extensions showed the conservatism of private company managers. One plan, which some Southern companies used, required a minimum amount of connected load (a minimum amount of sockets, appliances, and motors) for each mile of line and for each buyer.[2] One company, for instance, fixed a minimum connected load of 10 kilowatts for each mile of line, and 1.5 kilowatts for each customer. This company also had a minimum monthly bill for each consumer that varied with the connected load. The minimum bill never was less than $2; and when the connected load exceeded 1.5 kilowatts for each customer, the minimum bill increased above $2 a month. Another kind of extension policy fixed a minimum total revenue for a mile of line. In New York state, where the electric companies often used this control of rural-line investments, the minimum monthly revenue for a mile of line commonly ranged from $12 to $24. If a line had only three customers, the minimum monthly bill for each customer was $4. Buying service under a third extension policy, which was used by more than 40 per cent of the private electric companies, farmers paid the urban electric rates, but guaranteed a minimum annual amount of total revenue. The minimum amount of revenue, which covered the depreciation cost, reasonable return, and maintenance expense of the rural line, was figured as a percentage of the line investment. This revenue guaranty frequently was 18 per cent a year or 1.5 per cent a month of the line cost, though the monthly percentage ranged between 1¼ and 7 per cent for different companies.[3]

Other extension policies fixed the maximum investments for each customer rather than the minimum revenue for a buyer or a mile of line. Among Wisconsin companies, for instance, the maximum investment for a rural customer often was $300 to $400. If the maximum company investment was $400 for each buyer and if a company actually invested $1,100 in an extension that served only two customers, then each consumer paid $150 of the investment cost. In California another kind of investment policy was common. A certain amount of free line, measured by the connected load, was extended to rural customers. This was an example of the California plan: a lighting customer was given 100 feet of line, another 75 feet of line was allowed for each kilowatt of cooking load, and an additional 75 or 100 feet was extended for each horsepower of power load. Beyond these maximum limits the consumer advanced, for instance, 25 cents for each additional foot of line. Other electric companies, as in Michigan, had an investment policy that put the whole responsibility for rural-line investments on the customers. The rural consumers of one Michigan firm advanced $1,000 for each mile of line. When the line was completed, each customer received a $100 refund; and when other buyers were subsequently attached to the line, the company made additional refunds of $60 for each new customer until the total customer investment was repaid.

The Private Expansion. Before 1935 the private companies brought electricity to only a small part of the nation's farms. A conservative investment policy, combined with a moderate farm demand for electricity, limited the expansion. Enjoying the comforts of excellent monopoly privileges, the companies wanted substantial, immediate profits from rural service; otherwise they preferred to develop the expanding urban markets for electricity. At the same time the low-income tenants and scattered farmers, who often had only occasional uses for electric motors, did not have a large demand for electricity. Restricted by these conditions, the private electrification program served less than 4 per cent of the total farms in 1925.[4] Five years later about 9 per cent of the farms received electricity from central stations. And in 1935, the year when the

Rural Electrification Administration was created, slightly less than 11 per cent of the farms received electric service from central generating stations.[5]

In some regions the private companies extended rural electric lines rapidly in this period. One region was the Pacific Coast where almost 60 per cent of the California and Washington farms were electrified in 1935. Clusters of small, irrigated farms in the West afforded excellent opportunities for farm electrification. A company could serve four or more fruit and truck-garden farmers along each mile of a rural line. And in Utah, where more than 60 per cent of the farms were electrified before 1935, and in the irrigated valleys of other Rocky Mountain states there were further concentrations of rural electric service. Rural electrification developed early, too, in the North Atlantic and New England states. In the same period more than 50 per cent of the New Hampshire, Connecticut, New Jersey, and Rhode Island farms were electrified. Small speciality farms, the country homes of "gentlemen," and the rural homes of many urban workers explained the extensive rural electrification in the Eastern states. As long as the private companies could attach four or more customers along each mile of line, they usually were willing to finance the extensions.

Elsewhere the private companies did not extend electric lines to more than a small fraction of the farmers. Less than 10 per cent of the farms were electrified in most states. In the Midwestern corn belt and in the wheat and grazing areas of the Great Plains and Rocky Mountain regions the percentage of electrified farms usually was far below the national average. The farmers of these grain- and meat-producing areas, who had fairly good incomes during the twenties, could afford electricity at ordinary prices. But when the farms were large and less than two or three farmers were located along each mile of road, the companies usually did not want to build lines. A typical corn-belt farm contained more than a hundred acres—often more than a quarter section of land. And a typical Western wheat farm, cattle ranch, or sheep ranch was much larger. Seeing only a few farms along most roads, the private companies withheld investments in rural electric systems except where they had prospects of large power sales.

Farm electrification lagged, too, in the Southern states, even though several large companies tried to develop the rural markets. Contrasted with the farming areas of the Middle West and Great Plains, the rural areas of the South were quite densely populated. But the Southern farmers usually had low incomes and could not afford to buy much electricity. The incomes of the tenant farmers (the sharecroppers) commonly were low—too low for healthful living. And even some of the landowning farmers were barely subsisting. Lacking income, most Southern farmers could not buy more than a few appliances. The companies, safe in their monopolistic positions and behaving in a conservative manner, argued that they could not afford the lines from which most farmers took electricity for some home lighting, but did not operate large electric motors and many appliances.

THE NEW NATIONAL POLICY

Private company control of rural electric service did not last. Searching for profits, private firms gave most attention to the urban markets, selected carefully the locations of rural lines, and fixed high minimum bills for rural customers. They prospered and often had excessive earnings from urban markets, but the extra returns were not used to finance rural lines. Exercising their monopoly powers, they were able to fix investment rules and prices that curtailed the development of rural electric service. The private, restrictive standard was replaced, fortunately, by a more generous, less selective investment policy. After 1935 the federal government entered the farm-electrification market, just as it undertook public electricity production in some regions such as the Tennessee Valley. The Rural Electrification Administration was organized; this agency loaned funds for rural systems at low interest rates, encouraged the organization of cooperative systems, reduced the construction costs of lines, helped the cooperatives to negotiate electricity purchases from private companies, and acted as a general manager of the cooperatives.

Rural Electrification Legislation. Issuing an executive order in May, 1935, President Roosevelt created the Rural Electrification Administration, and earmarked funds for "generation, transmission, and distribution of electric energy in rural areas." A year later the Rural Electrification Administration was firmly established by Congress, and was authorized to finance and administer a rural electrification program. At this time a ten-year program, involving a $400,000,000 investment in rural electric service, was projected by Congress. The REA could allocate half of each appropriation according to its own judgment, though the allocation to any state could not exceed 10 per cent of the total appropriation. But Congress prescribed an allocation rule for the other half of any appropriation. This half was allocated to states in proportion to the farms that were not yet electrified. Congress wanted to concentrate the investments in the areas where the private companies withheld the construction of rural lines.

The REA is primarily a lending agency. Congress authorizes it to borrow from a government corporation, the Reconstruction Finance Corporation; about 85 per cent of the loanable funds are obtained from this source, and the remainder are obtained from direct Congressional appropriations.[6] The REA is authorized to make loans to both public and private suppliers of rural electric service, though a preference is expressed for public or nonprofit borrowers.* Loans are made for generating stations and transmission lines as well as distribution systems; funds can be loaned, too, for wiring farm homes and installing electrical and plumbing equipment. Loans for wiring and customer appliances were limited to terms that "reasonably" assured repayment. And the loans for line and plant construction originally were limited to a 25-year term (plus a maximum 5-year extension); later the law was revised to allow 35-year loans. All loans were expected to be self-liquidating. The administrator of the REA was supposed to determine, indeed, that the revenue and cost prospects assured self-liquidating investments before loans were approved. Finally, the REA had other powers in connection with the lending functions: it supervised the construction of rural electric lines, audited the construction costs, set up accounting systems for cooperatives, and acted as a general administrator and adviser of the systems.

When the REA was created originally by an executive order, it was an independent government agency. The governmental independence of the REA was retained in the Norris-Rayburn Act of 1936, and the first two administrators, Morris Cooke and Carmody, were responsible directly to Congress and the President. But the idea of "responsible" administrative government, designed to provide cabinet officer control of administrative agencies, caught up with the REA in 1939. The agency lost its independence, and was transferred to the Department of Agriculture. This solution, at best, did not improve administration of the electrification program.† Farm electrification was tied up, of course, with farmers and farming; but before the Department of Agriculture obtained control of the REA, it lacked experience with electrical problems. If the REA had to be controlled by a government department, the Department of the Interior, which already administrated many power-producing projects, probably was the best choice.

The Cooperative. Required by law to give a preference to public and nonprofit borrowers, the REA encourages the organization of rural electric cooperatives. Nearly all the government funds are loaned to cooperatives.[9] A rural electric cooperative, like cooperatives in general, is organized as a nonprofit corporation, and is managed by a board of directors that is elected by the members of the cooperative. A membership in a cooperative is open to any consumer, commonly sells for $5, and gives the member a right to vote each year for the directors. The number of directors varies from five to fifteen, though about 80 per cent of the systems have nine directors.[10] These directors, who usually are drawn from the well-to-do, active, and landowning farmers, can borrow funds, acquire or dispose of property, set up accounting systems and audit records, fix rates and service standards, exercise the right of eminent domain (under the model cooperative act), and make any necessary rules and regulations.

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* When the REA was created, the private electric companies were expected to borrow most of the available funds. But the private companies still did not see profitable rural investments, were fearful of the New Deal power program, wanted to avoid debt obligations to any government agency, and expected (or hoped for) an REA failure.[7] So the REA became a lending and managerial agency for cooperative and public borrowers.

† Shortly after the Department of Agriculture began to control the rural electrification program, a sharp controversy arose within the REA. This political conflict, involving an attack on the REA administrator and a struggle for political power, led to a Congressional investigation in 1943 and 1944.[8]

When the REA started to operate, most states did not have special legislation for the organization of rural electric cooperatives. Many state legislatures, doing what the REA wanted them to do, passed laws for cooperatives, and facilitated federal investments in the rural electrification program. A model cooperative act, drawn up by the REA and approved naturally by the cooperative-minded farmers, was adopted (except for various modifications) in more than half the states.[11] And in other states the cooperatives were organized under general corporation acts, under a law (as in Nebraska) for public power districts, or under a general cooperative statute that was passed originally for agricultural marketing cooperatives. Although the state legislation is not uniform, it does not impede the organization of electric cooperatives and the expansion of rural electrification.

A typical rural cooperative operates about 400 miles of distribution lines, serves about 1,000 customers, and has a plant investment of approximately $400,000.[12] A county is a common area of service, though some REA systems operate around a single town while others extend beyond the limits of a single county.* Being nonprofit organizations, the electric cooperatives extend their lines beyond the maximum profit limit of private companies—beyond the limit where the expected revenue increments exceed the expected cost increments. They extend into the "thin" territory where a scarcity of farms and a small electricity demand do not attract private investments. A cooperative can be planned so that a whole county is covered with electric lines; it can build beyond the investment margin where each customer pays his own way. Building their systems past the most profitable limits of service, the REA and the cooperative directors know that the losses on small and outlying members must be made up by other members. Unlike some private companies, the typical cooperative is willing to equate the total costs to the total revenue.

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* State-wide associations of cooperative systems are organized in some states; they are used to plan the development of rural electrification or to get special legislation. And the National Rural Electric Cooperative Association gives the cooperatives a place in national politics. Designed as a lobbying agency and supported by public power leaders as well as cooperatives, this national association levies annual dues on a cooperative of 10 cents a member.[13]

The cooperatives are subject to regulation by the REA. Being the banker for the rural electrification program, the REA determines the investments of each cooperative. This is the most important power of the REA. But regulation of the rural systems extends to other problems. When a cooperative borrows from the REA and signs a loan contract, it agrees to submit to various engineering, accounting, economic, and general managerial controls. The REA supervises the construction of the rural lines, standardizing the designs and trying to reduce the construction costs. Managers of cooperative systems are subject to REA approval, though the first choices of the cooperative directors usually are accepted. To protect the government investments and to make a better financial showing for rural service, the REA audits the construction costs, prescribes uniform accounting systems for the cooperatives, and audits the accounts every six months. Because the loan contracts require electric rates that are high enough to pay operating expenses, interest charges, and loan payments, the REA has some price control, too, of the cooperatives. Finally, the rural systems have access to special engineering services, legal protection against adverse court decisions or litigation, assistance as wholesale electric contracts are negotiated with private companies, and advice on the promotion of more electricity consumption.

Growth after 1935. The REA program produced an unprecedented growth of farm electrification. During the first ten years of the federal program the number of electrified farms increased more than fourfold.[14] After a decade of federal investments nearly 45 per cent of the rural populace received electricity from central stations.[15] And the REA and private companies had plans for serving most of the remaining farms as soon as the Second World War ended.[16] At the end of the war farm electrification still was greatest on the Pacific Coast and in the New England states, the areas where most of the expansion occurred before 1935. But the greatest rate of service expansion was achieved in other states, particularly the Southern states and the corn belt, where farm electrification lagged under private company management. Before 1935 no more than 4 per cent of the farms were electrified in any Southern state from Texas and Oklahoma to the Atlantic Coast; then in ten years the rural lines were built so rapidly that at least 10 per cent and sometimes as much as 30 per cent of the farms in Southern states were electrified. Forty per cent of the farms were electrified in most corn-belt states. After the REA was in operation for ten years, more than 10 per cent of the farms received electricity in all but two states, the sparsely settled Dakotas.

In 1935 only 743,000 farms were served with central-station electricity.[17] Only 10.9 per cent of the total farms obtained electric service from private or municipal plants. Then the federal government created the REA, sponsored the organization of cooperatives, made generous loans for rural electric lines, and forced private companies into a competitive race to expand rural service. From 1935 to 1946 the REA allotted about $600,000,000 worth of funds, and financed the construction of about 425,000 miles of electric lines.[18] More than 800 systems were energized, and nearly 1,300,000 customers were connected to REA lines.[19] In ten years the REA brought electric service to nearly a million farms.[20]

As the REA program developed, the private electric companies hurried to build more rural lines. Liberalizing their investment policies for line extensions, private systems reduced the charges for farm electric service; rural consumers were not asked to pay such large minimum bills or even to contribute all or a large part of the investment costs as they did before 1935. Rate schedules for rural service were reduced. And the companies sent out salesmen who persuaded rural people to take private service immediately and be free from cooperative and REA controls. The REA systems had more publicity, but the private companies added the most farms and rural customers. Some of the private market expansion unquestionably was hastened by the fast-moving program of the REA. The electric companies suddenly were confronted with a choice: they could make immediate investments in rural lines, or they could concede the markets to the cooperatives. Most of them preferred to make large investments in rural electrification, even if the prospective returns were not always satisfying—not always so high as they were before the REA disturbed the conservative pattern of investments.

The public and private interests in rural electrification clashed as the REA program was getting started. The "spite" line, as the cooperative men liked to call it, was the center of some early controversies. The REA charged that some companies built lines just before cooperatives planned to build the same lines.[21] When a group of farmers planned to organize a cooperative or when a cooperative was prepared to borrow from the REA, the private company in the area sometimes built its own line. Changing extension requirements, lowering rural rates, and offering service immediately, the private firms could attract farmers. To make matters worse for the REA and the cooperatives, the companies could extend lines to only parts of the unserved territories, and shut off the outlying farmers who anticipated cooperative service.* Yet the word "spite" did not adequately describe all the line-building conflicts between the private companies and the REA. Sometimes the private firms were forced to choose immediately between holding and conceding the farm markets. The federal program forced private investment decisions; it forced private investments, even if the private firms preferred to defer the investments. A private company did not act spitefully just because it wanted to hold a market, but it did act acquisitively.

Cost of Lines. Economies of rural line construction speeded the expansion of REA systems. Forsaking the substantial, "battleship" construction of private rural lines, REA engineers designed lines and construction methods that allowed an extension of the economical margin of farm electrification. The span between poles was doubled, and the number of poles was reduced to about twelve for each mile of line. Smaller poles were used; cross arms were eliminated from ordinary farm lines; and other innovations were effected in conductors and transformers. Nor did they build lines in the same piecemeal manner that the private companies often used before 1935. Building an entire cooperative system at once, the REA realized some investment economies. Both administrative and contractor expenditures were lower when five hundred or six hundred miles of rural line were built at a time, than they were when five, ten, or twenty-five miles were built at a time. And construction crews were divided into specialized groups. One crew dug the holes; distribution of poles was handled by another group; a third crew attached the hardware —brackets, bolts, and so on—to the poles; then the pole-setting crew did its work; wire stringing was the job of another group; and attachment of transformers and installation of the service lines to homes were further specializations. Using this division of labor, contractors could build from two to four miles of line each day.

The REA standard of line construction reduced the average investment cost below $1,000 a mile. As experience with line construction was acquired, the cost of construction often fell far below $1,000 a mile. For instance, in one year the average cost of single-phase lines—two-wire lines without cross arms—was $620 a mile.[23] Yet the REA, like the private companies, incurred higher costs of construction where a sizable power consumption called for more than single-phase lines, where the terrain and soil formation affected the construction speed, and where special precautions were taken against wind and sleet. Some lines cost $1,000 or trified. Forty per cent of the farms were electrified in most corn-belt states. After the REA was in operation for ten years, more than 10 per cent of the farms received electricity in all but two states, the sparsely settled Dakotas.

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* After some cooperatives were in operation, they preferred to make advance payments on their indebtedness rather than extend their lines to unserved farmers. The REA condemned this practice that resembled the "cream-skimming" method of private companies.[22] Like private firms, these cooperatives wanted financial success rather than the maximum possible amount of electric service.

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The public and private interests in rural electrification clashed as the REA program was getting started. The "spite" line, as the cooperative men liked to call it, was the center of some early controversies. The REA charged that some companies built lines just before cooperatives planned to build the same lines.[21] When a group of farmers planned to organize a cooperative or when a cooperative was prepared to borrow from the REA, the private company in the area sometimes built its own line. Changing extension requirements, lowering rural rates, and offering service immediately, the private firms could attract farmers. To make matters worse for the REA and the cooperatives, the companies could extend lines to only parts of the unserved territories, and shut off the outlying farmers who anticipated cooperative service.* Yet the word "spite" did not adequately describe all the line-building conflicts between the private companies and the REA. Sometimes the private firms were forced to choose immediately between holding and conceding the farm markets. The federal program forced private investment decisions; it forced private investments, even if the private firms preferred to defer the investments. A private company did not act spitefully just because it wanted to hold a market, but it did act acquisitively.

Cost of Lines. Economies of rural line construction speeded the expansion of REA systems. Forsaking the substantial, "battleship" construction of private rural lines, REA engineers designed lines and construction methods that allowed an extension of the economical margin of farm electrification. The span between poles was doubled, and the number of poles was reduced to about twelve for each mile of line. Smaller poles were used; cross arms were eliminated from ordinary farm lines; and other innovations were effected in conductors and transformers. Nor did they build lines in the same piecemeal manner that the private companies often used before 1935. Building an entire cooperative system at once, the REA realized some investment economies. Both administrative and contractor expenditures were lower when five hundred or six hundred miles of rural line were built at a time, than they were when five, ten, or twenty-five miles were built at a time. And construction crews were divided into specialized groups. One crew dug the holes; distribution of poles was handled by another group; a third crew attached the hardware —brackets, bolts, and so on—to the poles; then the pole-setting crew did its work; wire stringing was the job of another group; and attachment of transformers and installation of the service lines to homes were further specializations. Using this division of labor, contractors could build from two to four miles of line each day.

The REA standard of line construction reduced the average investment cost below $1,000 a mile. As experience with line construction was acquired, the cost of construction often fell far below $1,000 a mile. For instance, in one year the average cost of single-phase lines—two-wire lines without cross arms—was $620 a mile.[28] Yet the REA, like the private companies, incurred higher costs of construction where a sizable power consumption called for more than single-phase lines, where the terrain and soil formation affected the construction speed, and where special precautions were taken against wind and sleet. Some lines cost $1,000 or more a mile; others were built for less than $500 a mile. As an example of low-cost construction, a cooperative in Texas, using only three or four poles per mile in some places, built a 1,600-mile system at an average cost of $425 a mile.[24] Effecting economies and adjusting the construction plans to prospective earnings, the REA tried to reduce investment costs so that service could be brought to sparsely settled areas and low-income farmers.

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* After some cooperatives were in operation, they preferred to make advance payments on their indebtedness rather than extend their lines to unserved farmers. The REA condemned this practice that resembled the "cream-skimming" method of private companies.[22] Like private firms, these cooperatives wanted financial success rather than the maximum possible amount of electric service.

Loans and Their Repayment. The REA program is a distinctive social achievement of federal government, a product of new political horizons and a broader social vision. Economical construction of rural lines, low electric rates, and many county-wide or even larger systems—these are some of its accomplishments. A nonprofit basis of management, the cooperative, frees numerous villages and farmers from the selective, profit-making controls that the private firms once exercised over rural as well as urban electric service. Yet nothing about the program is so noteworthy as the rapid expansion of electric lines. In a few years the REA financed and managed many cooperatives, numerous transmission and distribution lines, much consumer equipment, and some generating stations; it even forced new standards of rural investment and pricing on the private firms. While the rapid cooperative expansion of service was a great social achievement, the program had its costs. In our business-minded society the investment costs are not likely to be ignored; indeed, we can expect the liquidation of loans to be one political test of the federal program.

The REA, obtaining most of its funds from the RFC and the remainder directly from Congress, is supposed to make self-liquidating loans. For the present the REA is not authorized to subsidize farm electrification; it cannot disregard the relation of revenue and cost as rural lines are extended. Electric service for every farmer may be a public policy toward which Congress is moving, but subsidies for farm electric service are not yet approved. As the public investment policy stands now, the administrator of the REA is expected to foresee enough revenue for investment liquidations before loans to the cooperatives are approved. To safeguard public investments, the REA specifies that 75 per cent of a cooperative's members must sign wiring contracts before the construction of a line begins. It usually wants projects that have at least three customers a mile, though it sometimes approves lines with less than two customers per mile. And the expected monthly consumption for the average customer commonly is approximately 90 to 100 kilowatt-hours for approved projects; but the REA provides funds for some lines where the monthly demand estimates are as low as 60 kilowatt-hours for the average customer.[25]

Although they are expected to repay the government loans, the cooperatives are not hard pressed by the loan contracts. When the Rural Electrification Act was passed in 1936, cooperatives were given as much as twenty-five years in which they could repay the loans. At first the interest rate on the loans was approximately 3 per cent. In 1944 Congress liberalized the borrowing terms so that electricity could be extended to more farm homes; the REA charges a flat 2 per cent on all loans, and allows some cooperatives to repay their loans over a 35-year period.[26] It recognizes, furthermore, that a cooperative cannot become a going concern at once. Five or more years can pass before the cooperative consumers respond fully to electric service—before they are able to afford many appliances. Making an allowance for the maturity of the electricity demand, the REA arranges a scale of loan payments that gradually increases during the first 8 years of the contract. No payments are made during the first 2½ years; only the interest on a loan must be paid during the next 1½ years; and during the next 4 years the payments gradually increase until the full loan payments are made. Most of the cooperative loans, consequently, are paid during the last 17 years of the 25-year loans or during the last 27 years of 35-year loans.

Can all cooperatives repay their debts to the REA? The REA expects full repayment, and urges the prospering cooperatives to make advance payments. As the financial record stands now, nearly all the cooperatives have enough earnings to cover their loan obligations. Only a few payments are overdue.[27] Yet the question of the cooperatives' solvency cannot be conclusively answered now. We must wait until more cooperatives are in operation for at least eight years, until more electric systems are obligated to make full-scale payments on their loans. The demand responses and appliance purchases of many members, too, are not yet complete. And the electricity consumption and revenue must be tested under low as well as high farm incomes before the self-liquidating character of the loans is known. The investment record of the REA still is an uncertainty.

Some general observations indicate that all the farm electrification investments cannot be liquidated. Two facts are undeniable: the REA is anxious to expand the limits of the farm electrification program, and it is willing to invest as much as Congress appropriates for the program. Congress determines the total investments; the REA chooses the projects and allocates the investments. The REA clearly tries to choose projects that have the best prospects of loan repayments. But this does not mean that each project promises a full liquidation of the public investments. The REA, apparently anticipating either private or cooperative service for 75 per cent or more of the American farms, may be hard pressed to reconcile extensive farm electrification with self-liquidating investments.

According to plans that were announced in 1945, the REA seeks to bring electricity to 3,600,000 additional dwellings.[28] As more and more funds are invested, the rural systems are extended into thinner and thinner territory. Fewer customers are attached to each mile of line, and the prospective electricity consumption for the average customer decreases. Carried far enough, the investments in rural electrification projects cannot always be self-liquidating. The investments can be extended beyond the point where they can be repaid out of electric revenue. Even if all the present rural investments are self-liquidating, perhaps another appropriation carries the program past this point. If Congress continues to provide funds for rural electric service, it probably must admit sometime that it is subsidizing part of the service.

No REA loan is completely riskless. In our society only a few investors, public or private, ever make riskless loans or investments. At least the rural electrification business is not the place where a person looks for riskless loans. Even if the REA carefully studies applications for loans and is more cautious than even the economical congressmen want it to be, all the loans are not sure things. This does not mean that all rural electrification loans have the same chance of default; the risk of default can be very low in prospering farming areas, but it is likely to be high in marginal, eroded, dry, and sparsely settled areas. Only a few loans may not be fully paid; perhaps no more than twenty-five out of one thousand loans are not completely paid up, though the chance of nonpayment increases as the rural lines are extended to more low-income, thinly settled territory. Some unpaid loans are a certainty. The risks of nonpayment can be minimized, but they cannot be wholly eliminated. These unpaid loans are public costs of rural electrification. Anticipated loan losses can be charged to cooperatives, but the REA does not propose charges to the prospering cooperatives with which the losses from other cooperatives can be covered. Interest rates can be high enough to cover the probable losses, but Congress specifies a 2 per cent rate of interest that is slightly less than the average cost of long-term federal borrowing. No revenue is collected from rural cooperatives that can be used to pay even small loan losses. Being sure of some unpaid loans and paying the planning and administrative costs (the cost of maintaining the REA), the federal government clearly does not have a self-supporting program of rural electrification.

Public investments in a rural electrification program can be evaluated in broader terms than simply the loan repayments. Bringing electricity to rural people who may never be served by private companies, the REA obviously performs an important public service. Subsidation of farm electric service, in fact, can be a necessary public compensation for the earlier service policies of private electric firms. Electric companies were not obligated to extend service lines to farmers as well as urban customers. When certificates of convenience and necessity were issued, state commissions did not impose broad service obligations on the private firms. The general service obligation, the obligation to serve all who come for service, was not applicable to rural service. A city was the common limit of the service area of a company. And the company managers controlled most of the investment, service, and pricing policies for rural extensions. As long as the urban and adjacent rural areas were not treated as a single unit for rate making and service distribution, some companies were sure to differentiate between rural and urban service, and to make limited service extensions to farmers. The federal program of farm electrification corrects an early deficiency in public utility regulation.

The state commissions had chances to reduce rural electric rates, and to narrow the price differentials between rural and urban service. When the excessive earnings of electric companies were eliminated, the commissions were in positions where they could reduce the rural rates rather than the urban rates. This was not done. But the federal program does reduce the rural electric rates. And insofar as low-priced electricity is considered a national benefit, the REA deficits can be treated as social costs. There is a parallel in the case of mail service. The farmers get free rural delivery of mail, even though the cost of this mail service is greater than the cost of mail delivery in many towns and cities. When uniform prices are charged for postal services, the high-cost services, such as free rural delivery, are supported by the users of the low-cost services. The important purpose is not maximum profits from mail service, but a wide distribution. Likewise, the cost of some farm electric lines can be imposed by income taxation on the whole populace. The people in cities, who already enjoy low-priced electric service, can provide the tax revenue and pay the investment losses on belated extensions of farm electric service.

The Reinvestment Problem. The REA does not have any plans now for public reinvestments in cooperative systems. After the loans are paid, each cooperative is expected to have a fully maintained plant and a sizable depreciation reserve. At the end of each year a cooperative is expected to credit a sum to the depreciation reserve; this credit is 3 per cent of the property value, less the plant-maintenance expenditures for the year. After the depreciation reserve is about 25 per cent of the property investment, the depreciation charges are expected to equal the maintenance expenses. Then the cooperative continues its operations with a plant that is worth approximately 75 per cent of the original plant investment.* These excellent, steady conditions of plant maintenance are not yet certain. They are the achievements for which the REA plans and hopes.

Some prospering cooperatives can repay their loans and maintain their plants. Less prosperous systems can repay the loans, but they cannot finance all the plant replacements too. And some systems, which cannot meet all their loan obligations, cannot finance equipment replacements out of the available revenue. Even though the objectives of maintained plants and sizable depreciation reserves are attractive, the REA must stand ready to finance replacements of rural electric systems. When the last year of loan repayments comes around, some cooperatives need more funds for new poles, wire, and other replacements. Some of them never get out of debt; or they are out of debt for only a few years. Yet public reinvestments in electric cooperatives are no worse, in fact, than the refunding operations of private utility companies. Like a private firm with outstanding securities, a cooperative, too, can be successful even though it is always indebted to the REA.

Taxation of Cooperatives. Being nonprofit organizations, the cooperatives receive tax concessions from the federal government and some state governments. They do not pay federal taxes on electric sales or net income, though they do pay social security taxes. State governments commonly exempt cooperatives from income taxes. And the burden of property taxation often is lightened for them. In many states they do not pay any property taxes for several years; the tax-exemption period, for example, is two years in Iowa, six years in Wyoming, twenty years in Georgia, and twenty-five years in Louisiana.[29] Property-value assessments, ranging from $50 to $300 a mile of line, often are low. Following the Wisconsin method of taxation, some states substitute a low gross-revenue tax (2 or 3 per cent) for all other taxes. And in Minnesota a tax of $1 for each member is paid by cooperatives, whereas the previous ad valorem tax averaged about $4 for each member. Having political strength and being semipublic organizations, the cooperatives pay much lower taxes than the private companies.

Cost of Electricity. Cooperatives commonly are distributors of electricity. Most of them purchase electricity from private companies, municipal plants, or large public plants such as the TVA. The wholesale price of electricity, being a large part of a cooperative's total cost, is an important determinant of the retail prices. If cooperatives pay low wholesale prices for electricity, they can afford to charge low prices to their members. When they buy electricity from the TVA, Bonneville Dam, Grand Coulee Dam, Boulder Dam, or other federal projects, they get their best bargains.* These federal projects, trying to stimulate more rural consumption of electricity, commonly sell electricity to cooperatives at the same wholesale prices that they charge to municipal plants. These public sources usually provide electricity for less than 1 cent a kilowatt-hour; one rural system buys Boulder electricity for less than 5 mills a kilowatt-hour.[30] The federal power program is an important reason, in fact, for the widespread rural electrification in Southern and Western states.

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* This accounting procedure for plant depreciation resembles the retirement accounting and the "per cent condition" ideas that public authorities do not approve for private companies.

Most cooperatives buy electricity, however, from private electric companies. Here the REA systems get some assistance from state commissions. Recalcitrant private firms are required to extend service, though they argue sometimes that the rural systems are competitors.[31] Even when the private companies do not perform any rural electric service, the Wisconsin Commission orders service extensions to cooperatives.[32] But the state commissions have dissimilar standards for the prices that the private firms should charge to the rural systems. The Wisconsin Commission, for instance, has a simple measure of the wholesale prices: the prices at which private companies sell the same kind of service to municipalities or large industrial buyers.[33] On the other hand, the Kentucky Commission proposes a rate that covers "all additional costs incident to furnishing the service with a substantial margin remaining for general overheads and fixed charges."[34] This is a sort of marginal-cost measure of prices, though the Kentucky Commission does not say just how the "additional costs" are computed. And the Oklahoma Commission, seeking to encourage rural electrification, approves lower rates for rural cooperatives than for other users.[35] This commission desires price discrimination in favor of REA systems, but it wishes to avoid "unreasonable" discrimination.

Trying to reduce the wholesale prices that they pay to private electric companies, cooperatives do not rely altogether on state-commission regulation. As they negotiate directly with the private firms, the cooperatives, aided by the REA, use persuasion, threats of public electricity production, and other bargaining points. The loan contracts require REA approval of wholesale electricity purchases. But the REA does more than approve the wholesale prices; it takes an active part in the price negotiations. When the rural electrification program started in the thirties, the private companies often charged high prices for their wholesale service. Cooperatives sometimes paid average prices that were as high as 2 cents a kilowatt-hour.[36] Then the REA began to press down the prices. Now the REA apparently believes that an average price of about 1 cent a kilowatt-hour is reasonable for wholesale service. Yet as a consequence of reliance on the uneven bargaining forces, there is not yet any formal, objective measure of the reasonable wholesale price.

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* See Chap. 34 for a discussion of the prices that cooperatives pay for electricity from these federal projects.

Although the cooperatives usually buy electricity from private and public producers, they sometimes build their own generating plants. They become producers as well as distributors of electricity because private firms cannot produce or are unwilling to provide ample supplies of service, or because they believe that the costs of electricity can be reduced with generating plants. The REA approves loans for generating plants. During the first ten years of the program the REA financed more than sixty generating plants, and invested more than $45,000,000 (approximately 10 per cent of the total investments) in generating plants and transmission lines.[37] Most of them are small Diesel units that serve single cooperatives; others are large plants (usually steam plants) that produce electricity for several cooperative systems. The largest new generating and transmission system, the Dairyland Power Cooperative in Wisconsin, provides electricity for twenty-four REA systems. Encouraged at times by the REA,[38] a single cooperative or group of cooperatives bought private systems that included generating plants. The Holding Company Act facilitated cooperative purchases of private electric plants. Forced to form single-area, technically integrated systems, holding companies sold many operating properties to the highest private or public bidders.* Consequently some rural systems or groups of rural cooperatives bought electric generating plants as well as transmission and distribution lines.[39]

The construction of cooperative generating plants is another challenge to private electric companies. But it is not yet an important challenge. For the present the REA accepts private generation of electricity, and cooperative distribution of service. At least the REA does not openly propose a policy of public production; it does not clearly make the farm electrification program another step toward widespread public production of electricity. But this change can come sometime. As groups of cooperatives acquire experience with large, central generating plants, other cooperatives, too, may wish to produce electricity and to be free from private companies.† A few large plants, as in Wisconsin, can be attractive examples for more generating plants.[40] A policy change can come because the private companies refuse to sell electricity as cheaply as the cooperatives can produce it—or as cheaply as the most enthusiastic members of many cooperatives think they can produce it. And the change can come as a part of a public investment program that is designed, like other public works programs, to provide more jobs. Some proponents of public power production even talk now about small river dams that can produce enough electricity for a few cooperatives.

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* Integration of holding companies, including the sales of some operating properties, is described in Chap. 8.

† As long as cooperatives confine their services to farming areas, they do not seriously threaten the private firms. But rural, county-wide cooperatives can expand, buying up private systems or building duplicate systems if they cannot obtain the private plants. They can become electricity producers and distributors for urban as well as rural people. Such cooperatives already are planned in the Pacific Northwest where public-power men are trying to buy several private companies. If the idea works well in Washington and Oregon, it will spread to other regions.

Retail Rates. When prices are fixed for membership service, rural cooperatives are confronted with two objectives. They want to cover the service costs, including the loan amortization payments, and they want to expand the consumption of electricity. Prices should be high enough to realize the financial objective; yet, if too much attention is given to finances, the social end of electricity consumption is thwarted. The TVA rates for rural electric service, which are described in a later chapter, are uniform throughout the Tennessee Valley. Elsewhere the retail rates of cooperatives are not uniform, though these rates do have some common characteristics. Trying to meet their loan obligations, the cooperatives, like the private companies, charge a minimum bill to each member. The minimum bill for a customer, on which the REA gives advice, ranges from about $2.50 in Southern states to about $3.50 or $4 in Northern states. To achieve the objective of more service consumption, the cooperatives borrow another pricing technique from the private companies: the promotional rate schedule. Choosing promotional pricing, cooperatives commonly use a block price schedule.* This kind of price schedule contains a descending scale of prices; a member pays a lower and lower average price as his consumption increases.

When farmers have low incomes, a descending scale of prices does not induce more consumption of electricity. The incomes of some farmers are so low, in fact, that they cannot pay the minimum bills of cooperative service. Many sharecroppers in the South cannot afford a minimum bill of $2.50 a month for electricity. To provide electric service for such buyers who live along the routes of rural lines, the REA program has a limited, low-cost service. Investment economies are effected by installing low-capacity transformers, and by carrying electricity to farm homes through trenches instead of overhead lines. Although the 600-watt transformers limit the maximum electricity consumption at one time, these low-income consumers have enough electricity for simultaneous use of several lights, a radio, and a few small appliances. And the consumer charge for this service commonly does not exceed a dollar a month. Such an innovation in rural electric service is an example of the social considerations that can be found throughout the REA program.

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* This pricing procedure is described and discussed in Chaps. 27 and 28.

Commission Control of Cooperatives. The REA is opposed to state-commission regulation of rural cooperatives. One provision of the model cooperative act, which was drawn up by the REA, prohibits state regulation of cooperatives. But the REA tries to avoid open jurisdictional conflicts with state commissions. Such conflicts can bring out a hidden question: the legal right of a federal agency to control the intrastate business of cooperatives. Avoiding a Supreme Court test of the federal controls, the REA argues that state commissions are set up for private earnings and price regulation. Operating nonprofit systems that are not expected to exploit their consumers, the cooperatives do not need earnings control. Acting as the promoter and national manager of a rural electrification program, the REA wants to retain control of the cooperative systems. It allocates funds for rural electric service, and expects repayment of the loans. Being the banker of the program, it wants to control the prices, accounting practices, maintenance policies, and management of the cooperatives. And the REA naturally believes that it knows more about these regulatory and investment problems than the state commissions do.

The REA did not think that all state commissions clearly understood the pattern and purposes of the rural electrification program. The Massachusetts Department, for instance, did not allow a cooperative to borrow from the REA, because utility companies in Massachusetts never were allowed to issue large amounts of debt securities.[41] The Missouri Commission approved a private rural line, even though the REA showed that the company did not plan to serve so many farmers as a cooperative could serve.[42] Similarly, the West Virginia, Maryland, and Georgia Commissions approved private electric lines after cooperatives were ready to build the lines.[43] These were examples of the disinterest of state commissions in the electrification program. But they were examples of a rare rather than a common attitude among state regulators. Most commissions, desiring an expansion of rural electrification, did not stand in the way of the federal program.

Even if rural cooperatives serve only their own members, they are subject to state-commission control of rates and other matters in Kansas, Maryland, New Jersey, Virginia, West Virginia, Wyoming, and several other states.[44] They are public utilities. The Colorado and Missouri Commissions can control some parts of cooperative actions, but they do not intend to regulate the prices of cooperative service.[45] Other state commissions may wish to regulate rural cooperatives in future years.[46] But the legislatures of twelve other states, which are influenced by the REA arguments for the model cooperative act, exempt the rural systems from state-commission regulation. And in at least another eleven states either administrative rulings are issued against state control of cooperatives, or the commissions refrain from regulation.[47] Several state supreme courts have decided cases about the public utility status of rural electric cooperatives,[48] but the question has not yet been taken to the U. S. Supreme Court. The Supreme Court of Washington decided in 1939 that a cooperative was not a public utility organization and was not subject to commission regulation, because it was a nonprofit corporation.[49] A year later the Utah Supreme Court said, too, that the utility commission was created for another purpose than the regulation of the REA systems.[50] Seeing the monopolistic market position of cooperatives but seeing no conflict of consumers and producer interests, the Utah Court said, "If the rates are too high the surplus collected is returned to the consumers pro rata," and "if the rates are too low the consumers must accept curtailed service or provide financial contribution to the corporation." [51]

The Future of Rural Electrification. Both the REA and private companies plan to continue the expansion of rural electric service. Private systems are expected to add more rural lines until they are serving 40 per cent of the farms by 1948.[52] And REA has plans for a rapid future expansion; [53] a substantial part of the new customers will be farmers. Carrying out their programs, the REA and the private companies can satisfy nearly all the available rural demand for electricity. Allowance must be made, of course, for the farmers who do not want electric service, or who live beyond the practical reach of distribution lines. Some farms have no buildings; others do not have occupied buildings; a small percentage of farmers, living on isolated farms or in sparsely settled sections of the country, still must rely on individual generating plants for electric service; and many farmers do not buy (usually cannot afford) electric service even if distribution lines pass their homes.* Less than all the 6,000,000 farms are available for central electric service; perhaps 5,000,000 is the maximum possible number that will be electrified from central generating stations. If the private and cooperative plans for additional lines are realized, only a small percentage of farm homes will not have electric service or will not have access to it by 1950.

Rural electrification still is in the expansion stage where the private companies and the REA are racing to build lines and to attach customers. Congress and the REA set the pace, providing the funds and plans for nearly all electric lines that the private firms are not willing to build and for other lines that even the private systems are willing to construct.* Congressmen, having their political eyes on the rural masses, want all or nearly all farming communities to have electric service. They are willing to expand the program even though some investments cannot be fully liquidated—even though tax revenue must be used to support part of the rural electric service. And they probably will allow the construction of more cooperative generating stations and the acquisition of more private systems, though private production of much rural service probably will be accepted for a long time—for as long as the nation has a private electric industry. The REA or an equivalent agency will be a permanent regulator and promoter of cooperative service, and a constant irritation to private management. For the cooperatives the REA will continue to provide funds for plant expansions, protection against private companies and unfavorable legislation, and advice on rates, accounting, and engineering problems. For the electric companies it will present social standards of rural electric service and investments, another source of public-ownership plans, direct regulation of wholesale electric sales to cooperatives, and indirect price control (largely with comparative prices) for private rural service.

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*In 1945 the Edison Electric Institute, projecting the census data of 1940, estimated that 900,000 farms (with occupied buildings) had access to electric service but did not take it.[54]

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* One thing leads to another: having a rural electrification program, farm groups now want a similar federal program for rural telephone service.[55] Private and mutual telephone systems already serve numerous villages and farming areas, but many of these systems are deteriorating or are being abandoned. Federal investments, the farmers know, can restore the existing lines and expand the limits of rural telephone service.

Chapter 23

Radio Broadcasting, A Service Problem

DEVELOPING RAPIDLY after 1920, a new and distinctive public utility, radio broadcasting, has an important place in American life. We are a nation of radio listeners; more than four-fifths of the American homes have one or more radio receiving sets in them. Radio stations rival the newspapers as public sources of news; they compete with other means of entertainment; political campaigns, particularly the presidential campaigns, are conducted primarily over the radio—a good radio voice is a new characteristic of a successful politician; broadcasts of political propaganda are new and important factors in national and international relations; American businessmen advertise their products and try to expand their markets through broadcasting stations.

Radio broadcasting is primarily a private business in the United States. More than a thousand stations, including the new frequency modulation and television broadcasters, are in the commercial class, while only a few noncommercial stations are operated by nonprofit organizations, usually by educational and religious organizations.[1] These private American companies are subject to some public regulation, but there is no public control of earnings and prices because the services of commercial stations are sold to business interests (the advertisers) rather than to listeners. Public utility regulation of radio broadcasters is devoted predominantly to several output problems: the entrance of new broadcasting firms, and interferences between stations. Public control restricts the number of broadcasting stations, and controls the service limits of each station. But only a small measure of censorship is exercised by the federal government; the companies usually are free to choose the programs and advertising that are transmitted to the listeners.

THE PRESENT AMERICAN REGULATION

Federal regulation of broadcasting, the only kind of American control, began under the Secretary of Commerce who allocated transmission rights and conducted several conferences. Using a statute that was designed for marine radio transmission, he really could do no more than act as though he had authority. First, a Chicago station and later other stations "jumped" their frequencies and ignored their licenses in 1926,[2] created confusion in broadcasting, and necessitated improvements in federal regulation. The Federal Radio Commission was established in 1927, and it functioned until 1934. Then the Federal Communications Commission, which consolidated the regulation of all interstate communication services, took over the control of radio transmission.

Allocations of Licenses. Although the present public policy condones competition of broadcasting stations, only a limited number of transmitting companies can operate in the United States. If interference between stations is avoided and if clear reception for listeners is desired, one station cannot be allowed to duplicate or overlap the frequency and service area of any other station. Radio listeners naturally want clear reception of programs. It follows, then, that they can have only a limited choice of stations at any time. Prevention of interference between radio-station signals, indeed, is currently the main purpose of federal regulation.

The radio spectrum, ranging from the very low to the very high frequencies, is divided by international agreement into such categories as amateur, aeronautical, and point-to-point radio communication as well as international and domestic broadcasting. In turn, the FCC assigns the frequencies to different radio services of which standard and nonstandard broadcasting are the most important. Standard broadcasting, using amplitude modulation (hereafter called AM), has a frequency range of 550 to 1,600 kilocycles in North America and is currently the principal source of radio programs. This range is divided into channels that are 10 kilocycles wide, the minimum necessary width according to present technical conditions of AM broadcasting. More than 900 standard stations are in operation.

Television and frequency modulation, which are classified now as two kinds of nonstandard broadcasting, may eventually replace much of the AM service. After the wartime "freeze" was removed from radio expansion, the FCC made an allocation of the megacycle frequencies and began to issue many television licenses. Observing the numerous applications for television licenses and anticipating further technical improvements, the commission has good reasons to expect a large expansion of this new radio service. FM is now in the rapid expansion stage. Creating far less interference between stations than the present amplitude modulation, FM is a broadcasting innovation that increases the potential number of stations. To date the commission has issued conditional licenses to several hundred FM stations, and has applications from many more hopeful operators.[3] Some persons anticipate several thousand FM stations within a few years.

A pattern of license allocations is well developed, of course, for the standard (AM) stations. The main facts of a standard license are the frequency location and the broadcasting power. Varying principally the power with which each station's programs are transmitted, the commission determines how large the service area can be for every broadcaster. These power variations of broadcasting determine whether a station is in the local, regional or clear-channel class.[4] Local stations, which are assigned as much as 250 watts of power during the daytime, serve single communities or parts of metropolitan areas. Power restrictions on a local licensee allow the same frequencies to be used in many different communities; the local frequency channels are used by the majority of broadcasting stations. Regional stations, which usually have a maximum power of 1 kilowatt at night and 5 kilowatts in the daytime (a few regional broadcasters have 5 kilowatts of power at all times), serve whole metropolitan areas or limited groups of urban and rural listeners. Thus, when they are located in different sections of the country, several regional stations can use the same broadcasting frequency. Clear-channel broadcasters, which get their name from the fact that no interference with their service is supposed to occur at night, are assigned transmitting powers of 10 to 50 kilowatts a station.* Since they have wide broadcasting ranges, clear-channel stations cannot be licensed everywhere.

No American broadcasting station can be properly called a "superpower" station. Today the maximum broadcasting power of any station —any clear-channel station—is 50 kilowatts. That maximum was set by the old Radio Commission in 1928, a year after the commission first cleared certain channels for rural listeners. For a few years one station, WLW in Cincinnati, used a power of 500 kilowatts, but the FCC withdrew the special license of this station in 1939. More power for the clear-channel stations can bring additional rural listeners within the range of large-station service; high-powered stations can give farmers and villagers the kind of radio service that the people in metropolitan areas receive.[7] But the regional and local broadcasters are opposed to such large increases in broadcasting power, because they are unwilling to lose their national advertising to more powerful stations.

The present broadcasters are opposed to license changes which reduce the values of their own licenses.* Sometimes political and social groups, too, want to avoid further subordination of local and regional radio service to national broadcasting. A politician wants to reach his constituents through a radio station that is located in his own city or state, the newspaper owners of many radio stations are necessarily interested in the local or metropolitan limits of broadcasting, and numerous city and state organizations lose something if high-power, national broadcasting replaces low-power, local or regional broadcasting. The FCC, looking at the monopolistic and noncompetitive practices of business firms, does not wish to concentrate radio service in the hands of a few companies. Until the national interests become more important than regional and local interests in broadcasting and until the American ogre of concentrated business control either is dismissed or is offset by additional regulation, superpower stations will not be licensed. Consequently the owners of radio sets must depend on the large networks for national broadcasting service.

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* When a station has 50 kilowatts of power, the ground wave of the transmitter provides primary service that has a radius up to 200 miles during both night and day hours.[5] These limits of ground-wave signals, transmitted with a fixed amount of power, vary with the conductivity of the ground, the frequency at which they are sent, the efficiency of the antenna system, and electric noise (natural and man-made).[6] A radio transmitter sends another kind of wave—the sky wave. The sky wave travels upward, is reflected back to the earth at night, and provides secondary night service in distant areas.

Although frequency and power are the most important technical differentiations between AM broadcasting stations, the time restriction on a station's service is a further basis of differentiation. There are three important time classes of stations: unlimited-time, shared-time, and daytime stations.[8] About 60 per cent of the stations are licensed to broadcast programs throughout any day. Some stations, which are chiefly small ones, share their frequencies with another station in the same city or in some other city. About a hundred stations are licensed to operate only during the daytime when areas are not served by other licensees. Some of the daytime broadcasters are assigned to the clear-channels. Since sky waves, traveling upward and deflected by the ionosphere, carry clear-channel programs effectively to distant areas only after sundown, a place is left for some daytime stations. Some listeners in rural areas obtain service before sundown from one or more small stations—the daytime stations; and during the evenings they are served by distant, urban broadcasters—the clear-channel stations.

Permanence of Licenses. The Federal Communications Commission issues standard broadcasting licenses for three-year terms. Unlike the franchises for other kinds of public utilities, broadcasting licenses are definitely short-term rights to provide a public utility service. Such a short period serves the interests of listeners; for the FCC has an opportunity to make quick changes in frequency, power, and time allocations. If important technical changes appear, they can be used immediately because the broadcasting rights can be reallocated in a short time. Receiving new licenses every three years, the station owners can scarcely insist on firm protection of their broadcasting privileges. But these short-term rights do not satisfy the private owners. The broadcasters believe that short-term licenses leave them in precarious financial positions.[9] To defend their claims for longer licenses, the station owners emphasize the necessity of long-term plans; they must make investments in durable equipment and build up programs that are adapted to the allotted service areas. But they say nothing publicly about the most important point: the high market values of the licenses. Good broadcasting privileges in a good market often are more valuable, as station exchange prices show, than the broadcasting equipment; an investor naturally wants to protect these privileges with a long-term license.

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* More broadcasting power for clear-channel stations also can upset the economic positions of the networks. If the power of a few clear-channel stations is increased greatly, these stations can offer nation-wide service. They can compete directly with the networks.

The risks of short-term licenses really have been small. Many of the large and profitable broadcasting stations of today have operated continuously ever since the early twenties. They received their original licenses from the Secretary of Commerce. When the Secretary of Commerce undertook control in 1923 because station interferences created disorderly broadcasting conditions, he issued licenses, frequencies, and transmitting powers to the established stations.[10] Another Department of Commerce policy was a simple one: broadcasting rights were granted freely to encourage the rapid expansion of the radio business. Commercial stations, supported by revenue from advertisers, were preferred. And rights were distributed to newspapers, department stores, electric appliance manufacturers and dealers, and other business interests that wanted the profits of broadcasting. That respect for private enterprise persisted under the Radio Commission and the FCC.

Although the broadcasting rights must be renewed every three years, they are really permanent licenses. The FCC does not require extensive proof of useful broadcasting services every time the annual licenses are issued. The station owners have vested interests that the commission respects. What other choice does the FCC really have? There are no immediate replacements for the stations that have efficient equipment and many years of broadcasting experience. Even if the FCC is willing to take political chances and substitute new firms for some old and well established stations, it cannot easily find numerous new broadcasters who have good equipment, financial resources, and extensive experience. At any rate, the FCC, like its predecessors, does not withhold broadcasting rights from most established stations. Even though the station owners doubtless can be more comfortable with long-term licenses, the three-year grants do not have disturbing effects on the programs, equipment, and finances of private stations.

Conditions of New Licenses. Although most of the AM broadcasting locations are occupied, the Communications Commission has additional openings in some areas for principally local stations. And the commission has many openings for television and FM stations. The FCC examines carefully the applications for new licenses. It considers the possible interference with other stations, the kind of equipment to be used, and the technical knowledge of the applicant or his staff. Of these considerations the most important is avoidance of interference—preservation of a good technical order of broadcasting. The FCC also examines the financial resources of the applicant, and studies the probable sources of revenue. As the commission knows, a prospering station can present creditable programs. But when a station lacks investable funds and advertising revenue, it is hard pressed to make good use of the broadcasting privileges that are assigned to it. Consequently the commission usually does not favor the location of stations in towns that have less than ten thousand inhabitants.[11] Several characteristics of broadcasting service also are considered: the nature of an applicant's proposed programs, the listeners' needs for the service, availability of talent, and the applicant's acquaintance with local conditions. College stations sometimes are given large amounts of broadcasting power, because they can perform a special kind of state-wide service. But when an inadequate program plan is presented or when established stations are providing sufficient service, license applications usually are rejected. And the commission turns down some applicants, because they are not residents of the localities in which they are to operate stations.*

Competition of Stations. Competition of radio stations is an established national policy. And this policy can be expected to persist with FM and television broadcasting. A standard license, issued for a single year, specifies certain technical conditions of transmission: the frequency, the amount of power, and the hours of service. Licensing conditions are so defined that a station has exclusive use of a broadcasting channel within a given area. Exclusion of transmission interference, the main duty of federal regulation, is a common characteristic of all licenses, the unlimited-time as well as the shared-time and the daytime licenses. But, even though the regulators give exclusive rights to use frequencies so that listeners have clear program reception, they often allocate more than one broadcasting license to each region, metropolitan area, or community.

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* When two or more applicants apply for a single license, the FCC chooses the one, of course, that has the best qualifications. The Supreme Court, deciding the Pottsville case in 1940, did not believe that the courts should always review these decisions of the Communications Commission. Justice Frankfurter, speaking for the Court, said, "Congress which creates and sustains these agencies must be trusted to correct whatever defects experience may reveal. Interference by the courts is not conclusive to the development of habits of responsibility in administrative agencies."[12]

Large cities may have several unlimited-time stations as well as additional daytime or shared-time stations. Even small cities sometimes have more than one station. Despite the protests of existing stations, additional broadcasting rights are issued when technical conditions permit more stations and when the applicants are qualified to perform the services.[13] Maintaining the competitive policy, the FCC does not grant a new license to a broadcaster who already holds another license to serve the same community.[14] In 1944 the commission also began to take all but one license away from station owners who held, even for a long time, more than one license in a broadcasting market.[15] And when a newspaper owner and another party are applicants for the same broadcasting privileges, the FCC sometimes turns down the newspaper owner's application because it wants competitive dissemination of news.[16]

Broadcasters do not demand exclusive control of their areas. They accept the established rivalry between stations; the local and the regional stations apparently are willing to share the market—the local, regional, and national advertising—with each other. Perhaps the owners are tolerant of established competition because they are adjusted to it. But they do not like the entrance of new rivals; they do not favor further competitive adjustments and market sharing. This dislike for additional competitors does not stop the issuance of more licenses. The Sanders case, which the Supreme Court decided in 1940, concerned the entrance of a firm into a market that was occupied by another broadcasting station. Looking at the statutory authority of the commission, the Supreme Court observed that ". . . Congress has not, in its regulatory scheme, abandoned the principle of free competition, as it has done in the case of railroads. . . ." [17] And the Court went on to say that

> Plainly it is not the purpose of the Act [the Communications Act of 1934] to protect a licensee against competition but to protect the public. Congress intended to leave competition in the business where it found it, to permit a licensee who was not interfering electrically with other broadcasters to survive or succumb according to his ability to make his programs attractive to the public.[18]

Thus, even if the established stations do not like more competition, they cannot prevent the issuance of additional licenses.*

Competition of radio stations falls far short of being a purely competitive condition. The number of stations in any broadcasting area cannot exceed the limited number of broadcasting channels. New stations are licensed, moreover, only when profitable operation of them can be foreseen. If the FCC wants to maximize the competition between stations, then it must make the fullest possible use of broadcasting channels, licensing stations freely up to the limit of transmission interference and forcing some of the stations, those in small cities or the small stations in large cities, to abandon operations. But the commission clearly does not place competitive control of radio service ahead of all other regulatory objectives; it prefers prosperous stations that can present fairly respectable radio programs. Since the FCC does not issue licenses freely, some cities have only two stations and no city has numerous stations; either a duopoly or an oligopoly situation exists in many broadcasting markets. Even in the Los Angeles and New York City areas, where about twenty and thirty licensed stations respectively are in operation, broadcasting is not purely competitive.

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* The FCC usually does not hear the protests of existing stations against new stations. Yet, if an existing license is modified because a new license is issued, then the FCC must afford the station owner a "reasonable opportunity" to present evidence against the new license. The Supreme Court upholds the right of a licensee to present evidence under these conditions.[19]

The competition between stations is not equalized. Clear-channel or regional stations have larger service areas and access to more advertising revenue than the regional stations of the area; and the regional stations reach more listeners and get more advertising revenue than the low-power, local stations with which they compete. And daytime, limited-time, and shared-time stations obviously are not powerful rivals of the broadcasters who can operate at all times. Since licensing privileges are unequal, some of the stations have an advantage in a competitive conflict.[20] Even if the lesser stations struggle to get revenue and to make profits, they still may not be able to take many advertisers away from the stronger broadcasters. Indeed, the high-power, unlimited-time stations may have access to enough advertising revenue so that they need not fear the aggression of low-power stations.

The Networks. Network broadcasting, the simultaneous transmission of the same program by several stations, is not subject to direct governmental control. Yet it is an important part of American radio service. Four national networks have affiliation contracts and program outlets with about three-quarters of the licensed broadcasting stations, negotiate the big advertising contracts, make extraordinary returns, and control the national programs that appear during the best broadcasting hours.[21] One of the coast-to-coast networks, the National Broadcasting Company (owned by the Radio Corporation of America), was the largest network organization for a long time, but it was hard pressed to maintain the front position after 1940. The American Broadcasting Company originally was the Blue Network of the NBC system.* After the Federal

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* When the Red and Blue Networks were affiliated in the NBC system, they seemed to compete vigorously for listeners and advertising revenue. But the NBC, pooling the

Communications Commission undertook indirect regulation of network organizations and gave particular attention to the extensive power of NBC, the Blue Network was sold in 1943. The Columbia Broadcasting System, which started to operate in 1927, is controlled by the Paley family, owns several stations, and has broadcasting contracts with about 15 per cent of the nation's stations. A fourth national network, the Mutual Broadcasting System, was organized in 1934; the principal stockholders are two radio stations—WGN, a subsidiary of the company that publishes the Chicago Tribune, and WOR, a subsidiary of R. H. Macy & Company. In 1940 the number of Mutual stockholders was expanded to include regional networks and more stations, though WOR and WGN still are the main stockholders.

Control of national network broadcasting is confined to four corporate systems, to four organizations that have control of the best outlets.* All the clear-channel stations are owned by or affiliated with the national networks. And most of the wattage—the broadcasting power—of the unlimited-time stations is tied up with the networks.[24] Until the FCC started indirect control of the networks, the contracts between the networks and their affiliated stations showed clearly how the network systems dominated American broadcasting.[25] Before 1940 three of the national networks usually bound affiliated stations to 5-year contracts, while they could cancel the same contracts on 12-month notices. The CBS contracts always required exclusive outlets; eventually NBC and Mutual also negotiated exclusive contracts. Both CBS and NBC held optional time rights for the use of their outlet stations; after networks gave a 28-day notice, they could require outlet stations to carry a program during specified hours, usually the best broadcasting hours of any weekday or Sunday. But when the proposed network program did not seem to be in the public interest, the outlet station could reject it. And the network companies, favoring themselves, commonly dictated the compensation that the outlet stations received from network programs.[26]

Since the network systems were not directly controlled by the FCC, they negotiated their own kind of affiliation contracts for a long time. The FCC did not try to restrict the conditions under which a licensed station could be affiliated with a network. But when the networks began to tighten their controls of affiliates after 1935, the commission took an

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finances and expecting dividends from both networks, did not allow the rivalry to affect the earnings of the two organizations. The Blue and Red Networks practiced "intramural" competition.[22]

* In addition to the national networks there are several regional networks.[23] Among these are the Yankee Network in New England, the Michigan Radio Network, the Texas State Network, the Pacific Broadcasting Company in Washington and Oregon, and the Don Lee chain of outlets in all Pacific coast states. Either the regional networks or the individual stations in them commonly are affiliated with a national network.

interest in network broadcasting. Following an extended investigation, the FCC in 1941 ordered several important changes in affiliation contracts.[27] Unless the licensed stations made these changes, their licenses could not be renewed. Licensees were forbidden to sign more than one-year contracts with network organizations; elimination of exclusive-outlet contracts was ordered; and the option time was limited by commission control. Breaking up the NBC control of the Red and Blue Networks, the FCC forbade a licensed station to sign a contract with a company that owned more than one network; but networks still could own licensed stations as long as no more than one station was owned in any one city. Another change was important; the licensed stations were ordered to keep control of the prices that they charged for their broadcasting services. Retaining this control, station owners could bargain with networks about their compensation from network programs.

The Supreme Court supported this order of the commission. Taking a broad view of the problem, the Court found that the chain broadcasting regulations were a "particularization of the Commission's conception of the 'public interest' . . . ,"[28] and were based on a broad Congressional delegation of regulatory power. The Court did not question the broad delegation of authority. Instead, Justice Frankfurter, speaking for the majority of the Court, said,

> It is not for us to say that the "public interest" will be furthered or retarded by the Chain Broadcasting Regulations. The responsibility belongs to the Congress for the grant of valid legislative authority and to the Commission for its exercise.[29]

This decision of the Supreme Court assured the FCC a large measure of indirect control of broadcasting networks. It broke the monopolistic grip that each one of the network companies had on its outlet stations. Then the stations were more free to choose between networks, or to bargain for higher payments for transmitted programs. But the decision did not greatly increase the competition between networks. There are only four national network systems. Such a small number can agree informally to abstain from price cutting, and to avoid other competitive practices that are abhorred by the business leaders of the industry. Even if the number of national networks ever increases to ten or fifteen, sharp competition for outlets still is not a certainty.

Censorship. The FCC has only modest controls of a licensed station's programs. As the Supreme Court observes in the Sanders case, "The Commission is given no supervisory control of the programs, of business management or of policy."[30] The Communications Act specifies a few limitations of radio programs. It forbids the use of obscene, indecent, or profane language in radio broadcasting; sponsors of radio programs must be announced; a radio station cannot be used to promote a lottery or a similar scheme; and if a radio station provides broadcasting time for a "qualified candidate for any public office," it must afford equal broadcasting opportunities to other candidates for the same office. And when licenses are renewed, the FCC can consider the general conduct of stations. If the commission does not believe that a station owner is acting in the public interest, it can withhold the renewal of the license.

Before 1934 the Radio Commission refused to renew the licenses of several stations.[31] A cancer doctor lost his broadcasting license because he made "personal and bitter attacks" upon public utility companies, state officials, and the American Medical Association. Another doctor, known widely for his goat-gland operations, lost his broadcasting rights because medical societies attacked his practice of making diagnoses a prescriptions by radio; this denial of a license was upheld in the federa courts.[32] In another instance the Radio Commission, which again was upheld by a federal court decision,[33] refused to renew the license of a California minister who made attacks on public officials, courts, organized vice, and other matters. And a small station in Portland, Oregon, lost its rights because in a bitter political campaign one of the candidates for office used the radio station to vilify his opponent and to defame "responsible" citizens. The commission thought that the licensee should have prevented these indecencies, even if the offending candidate had a contract for the use of station time.

After the Federal Communications Commission began to regulate in 1934, no licenses were withdrawn. Yet the FCC, regulating in a milder way, exercises some censorship of radio programs. Now and then a program that disturbs many listeners is investigated. Sometimes a broadcaster is warned that the continuation of certain programs can lead to the loss of his license. Protecting guileless listeners, the FCC ordered several stations to stop astrological programs or risk the loss of their licenses.[34] In one case the FCC expressed displeasure with a station that refused to pay music royalties and operated a makeshift music school in conjunction with the radio station.[35] A similar warning was given to a radio station which intercepted the coded messages of the German and British navies and made news scoops. Although the commission did not revoke the station's license, it did say that ". . . grave doubt has been cast upon the licensee's qualifications to operate . . . in a manner consistent with the public interest."[36] And the commission does not approve the conservative program policy that no time shall be sold for the discussion of controversial subjects, such as the problems of organized labor.[37] Although the commission recognizes the limitation of broadcasting time and the necessity of program selection, it does not believe that only programs by charitable and certain commercial interests are "consistent with the concept of public interest."

SEVERAL SOCIAL AND ECONOMIC CONDITIONS

Two public problems of radio broadcasting are dealt with by Congress. One of these is expansion of broadcasting service; for the present this problem is solved largely by issuing licenses to private companies. Another problem is the allocation of broadcasting frequencies and electric power so that listeners can receive programs clearly. This part of radio regulation is designed to solve technical problems, particularly the avoidance of interferences between stations. Set apart from the present public regulation, several social and economic conditions are important factors in the American radio industry. Among these conditions are (1) the unequal distribution of radio programs—the deficiencies of broadcasting service in some rural areas, (2) the unequal earnings of radio stations that can be explained partly by unequal broadcasting privileges, (3) the widespread use of advertising, and (4) private management of radio programs.

Geographic Distribution of Service. Radio service is not evenly distributed throughout the country so that all owners of receiver sets have access to the same amounts of it. Radio stations are concentrated in large cities. Nearly 10 per cent of the licensed stations are located in cities having a population of a million or more, while approximately half are located in cities of one hundred thousand or more.[38] The large cities of more than one hundred thousand inhabitants have 90 per cent of the clear-channel stations and 60 per cent of the unlimited-time stations.[39] Having the majority of the stations and nearly all of the most powerful stations, the large cities are the centers of the American broadcasting industry. Radio earnings are largest in the large cities. Guided by prospective earnings, the private investors know that the advertising revenue in a large city or metropolitan area is large enough to support several stations. And the large cities, particularly New York and Los Angeles, also are good sources of radio talent.

Although only four cities with 50,000 or more inhabitants do not have radio stations, most of the cities and towns with less than 25,000 inhabitants lack local stations. Unlike retailing and professional services, broadcasting cannot be scaled to the size of the town so that any hamlet can support an ordinary commercial station. The financial success of a private broadcaster depends on the transmission range and the available advertising revenue. Market areas and advertising revenue are small in many cities and in all villages; they frequently are not large enough to support radio stations. Rural broadcasters cannot hope to get much revenue from advertisers if low amounts of power and short transmission ranges are assigned to them. Small FM stations, being cheaper to operate than AM stations, may increase the rural radio service, but advertising revenue still controls the economical limits of expansion. These small stations suffer from other handicaps too; they cannot find or afford excellent talent for their programs, and are not always profitable outlets for network programs.

Some rural listeners living close to large cities or in the densely populated states have access to several stations at all times. Many others residing in sparsely settled areas and owning ordinary receiving sets, get primary service (ground-wave service of a minimum signal intensity) from no more than one or two stations. Some of them get no primary service at all. The FCC estimates that about 15 per cent of the rural population lacks primary service in the daytime, and more than 30 per cent do not get it at night.[40] Clear-channel stations, using as much as 50 kilowatts of power, provide a secondary service over much of the land; after sundown many listeners are dependent altogether on these stations. This secondary service is achieved with sky-wave radiation for which the broadcasters, experiencing differences in sky-wave propagation, cannot avoid some fading.[41] Yet the clear-channel broadcasting does not balance the geographic distribution of radio service. Nearly a fifth of the nation's population, living in more than half of its area, lacks satisfactory radio service during the evening hours.[42] The availability of advertising revenue, the important financial factor of American broadcasting, results in ". . . laying down too many tracks of good reception to thickly inhabited centers and too few or none at all to sparsely settled areas. . . ."[43]

Congress tried to effect an equitable geographic distribution of radio service. In 1928 it enacted the Davis Amendment which was designed to equalize broadcasting service. The Radio Commission was directed to maintain, as nearly as possible and insofar as applications were made for licenses, an equal allocation of broadcasting powers, broadcasting frequencies, and broadcasting time between the states and five national zones. This plan of license allocations, based on the population of the states and zones, was approved by the Supreme Court.[44] It was not an easy way to handle the distribution of broadcasting rights.[45] These privileges already were distributed according to prospective earnings—according to a private investor's standard. Broadcasters stayed out of the sparsely settled areas, because they did not foresee enough advertising revenue to justify investments. If such an equal allocation of service were realized, either some of the metropolitan stations would be abandoned or new broadcasters would have to locate in the sparsely populated areas. Strictly enforced, such an equalization plan could eliminate some large-city stations, but it was not certain to increase the number of rural stations. Recognizing these facts, Congress repealed the Davis Amendment in 1936. Now the FCC is directed to grant rights so that there is a "fair, efficient, and equitable distribution" of radio service between states and communities.

Earnings of Stations. Some station owners obtain high returns on their investments; others have low returns or even deficits. All the standard commercial stations do not have equal opportunities to obtain advertising revenue. The differences in advertising revenue can be explained partly by the station locations.[46] About one-fourth of the radio stations are located in towns that have less than 25,000 inhabitants. These stations receive less than 10 per cent—perhaps no more than 5 per cent—of the national expenditures for radio advertising. Many stations apparently struggle to remain in existence. On the other hand, less than 20 per cent of the stations are located in cities having 500,000 or more inhabitants, and they receive more than half the advertising revenue.

The amount of a station's power, which determines its service area, is a further explanation of the gross revenue differentials. Advertising revenue usually increases as the amount of the allocated power increases. Clear-channel stations commonly receive more revenue than regional stations; and regional stations usually receive more than local stations. As a further fact, about 250 stations are not outlets for network programs. The affiliates of major networks obtain more advertising revenue than that of the independent stations. When they choose outlets, networks look at the market areas of stations; and the stations join the networks because they expect additional revenue.

A license can be a valuable, even the most valuable possession of a broadcasting station.* When a broadcaster is well located and has 5 to 50 kilowatts of power, the financial success of his station usually is assured. Yet, as federal regulation is practiced now, the earnings of broadcasting stations have no public significance. The paramount problems are the widespread distribution of radio service and clear reception of radio programs. The important fact about a clear-channel station, for example, is the extension of service to rural areas, not the earnings differentials between local and clear-channel stations. Unlike the regulation of other utility industries, radio regulation is not focused on price control. The public authorities do not protect advertisers, who are the principal buyers of radio service, against exploitation by radio stations. Nor does Congress want to take the excessive earnings away from the most powerful and best located stations, requiring more noncommercial programs or using recaptured earnings to subsidize more stations in sparsely settled areas.

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* According to the legal concept of radio regulation, a broadcasting license does not give property rights to its holder. In the Sanders case the Supreme Court said, "The policy of the Act [the Communications Act] is clear that no person is to have . . . a property right as a result of the granting of a license."[47]

Radio Advertising. Broadcasting time is sold mainly to businessmen who want to find or hold markets for their products. Manufacturers of drugs, toilet goods, branded foods, and soap are the dominant buyers of broadcasting time. These business interests provide the financial basis for our private radio industry. The income from advertising supports the free programs for listeners, and justifies the private investments in radio stations and networks. Just as the advertiser pays for low-priced, mass distribution of newspapers and many periodicals, so he supports the free, widespread distribution of broadcasting service. Listeners know that some advertising is necessary, unless fees are assessed against receiving sets, government subsidies are paid to station owners, or public ownership of the industry is undertaken. Taking the radio industry as it is, listeners recognize the financial necessity of advertisements.

While they tolerate radio advertising, most listeners do not like it. Unobtrusive advertisements, such as brief announcements of the sponsors, naturally are the least disturbing; a statement of sponsorship or only a few words about the sponsor's products are not very annoying. But much of the advertising seems to be blatant, distorted, and repetitious. This kind is the least tolerable to the listeners, and is the most noticeable. Testimonials sometimes are repeated day after day until numerous people are disgusted with both the broadcaster and the advertiser; a commercial announcement often is pressed between bits of news or musical numbers so that no one can switch off the program before it is finished; and sponsors are allowed to tie their commodities to unrelated matters such as war events, a current topic of discussion, a historical subject, or any other handy medium. Just when the listener thinks he is getting news, a scientific or historical fact, or an interesting anecdote, a commercial announcement turns out to be the climax. New and old advertising tricks are worked again and again on radio audiences. Sales of commercial services and products obviously explain why the businessmen buy broadcasting time, and intend to make good use of it.

The radio stations and networks do not take all kinds of advertisements. They have some scruples that seem to be based primarily on a high business regard for the advertising tolerances of listeners. There is a trend, led by the national network organizations, toward shorter and more interesting commercial announcements.[48] Following the code of the National Broadcasters' Association, some stations limit the advertising time in any broadcasting period.[49] Some broadcasters also consult the Federal Trade Commission, American Medical Association, and other authoritative sources of information before they sell program time to some business firms. Some stations do not accept advertisers who want to sell deodorants, hard liquors, laxatives, or even, in a few instances, cosmetics.[50] And any kind of commercial announcement, like the "singing" commercial of the forties, can be so overworked and can become so annoying that some station owners, sharing the judgments of their listeners, forbid the use of it.

Programs. Although the FCC practices some censorship of radio service, the choices of programs are left almost altogether to the station owners, network organizations, and advertisers. The main criterion of program selection is a simple one: give the multitude of listeners what they want. Sponsors are more interested in large audiences than in high-quality programs. Trying to extend advertising to the largest possible number of families, the broadcasters and their sponsors do not want to satisfy everyone. Their programs usually are not arranged for the listeners of high cultural and intellectual interests. Instead they commonly make a low estimate of the average mental capacity, and adjust the programs to this intellectual level. They wish to reach the masses. In seeking the maximum commercial limits of radio programs perhaps they underrate the minds of most Americans. And they seem to overwork some kinds of programs so much that they begin to lose listeners and must start to exploit other and currently respectable programs. Yet as they choose programs they do have factual evidence of listener preferences; station owners spend large sums of money on extensive listener surveys, and check continuously on the popularity of regular programs. Even if American broadcasters do not know exactly what the audiences want, they probably have more information about their listeners than the broadcasters of other countries.

Controlled by common listener wants, American radio programs are primarily sources of entertainment. They are excellent sources of recreation. Music, particularly popular music, is dominant in the programs.[51] Broadcasts of sports events have big audiences. News programs, which became numerous and popular during the war years, sometimes contain competent interpretations of events, but more often they are condensations of the facts that are available in daily newspapers. A few news commentators have wide experiences and much knowledge; others rely on extensive radio experiences or spectacular reporting; and many of them are simply readers. Since simple continued stories and soap operas seem to appeal to manv American women, they are standard parts of broadcasting schedules. To reach a family audience and to serve people of different ages and tastes, broadcasters often use variety programs; a single program may contain some popular music, a number or two of semiclassical music, a brief dramatization of an event or story, and even some comedy. Speeches commonly concern politics or significant current events; a high level of intellectual discussion does not attract a large number of radio listeners. Entertainment as a "come-on" for commercial advertising is the main business of a broadcaster, not the education of the populace.

Duplication of programs is another characteristic of American broadcasting. While radio programs often are scarce in rural areas, duplications of programs are common in metropolitan areas. If an urban listener has a choice between six or eight stations, his choice of programs is narrowed because half the stations, let us say, are carrying the same kind of program. During daylight hours the channels seem to be clogged with serial dramas. At other times nearly every station has programs of popular orchestra music. During summer days and fall afternoons several stations in a city give play-by-play accounts of the same baseball and football games. And a succession of newscasters, some from local stations and others on network programs, appear during the early evening hours; each of them talks and reads, of course, about the same events. These are consequences of station and network competition. Each station wants a share of a profitable service, just as retail stores are clustered together and share the best part of a market area. This duplication is a special case of the social inefficiency of private broadcasting service.

Broadcasters have opportunities for censorship. Controlling the sales of time, they determine how much radio freedom the nation shall have. Selections of programs are inescapable, because the available broadcasting time is limited. But censorship of newscasts, speeches, humor, and dramas is a special characteristic of program selection—an evaluation of what the radio audiences should or should not hear. Perhaps the broadcasters, having a responsibility for programs and trying to serve all social groups, rightly deserve the authority of censorship. At any rate, they now can choose what is a worthy or unworthy program—what is good for listeners to hear. The choice of programs and the editing of radio scripts show a cautious, conservative attitude that reflects a desire to avoid offense to any significant political or business group. Blunt discussions of controversial subjects are tolerated during political campaigns, but at other times the broadcasters do not sell or give time to any public speaker.[52] Round-table discussions often are scheduled, because they are considered good ways to satisfy a cross section of listeners. The interests of advertisers are considered. Not only are advertisers the direct censors of their own programs, but also the stations and networks play up to them, avoiding offenses to these current or potential customers. Private control of programs clearly has a conservative, business side that does not allow a freedom of radio speech.[53]

On the business side of radio service the programs obviously are subordinated to advertising plans. But the program standards of broadcasting cannot be explained altogether in terms of entertainment and advertising. Some attention is given to educational programs—lectures by learned men, reports from state and federal government departments, symphonic and operatic music. Speeches of the President and other government officials are broadcast, even if the programs of advertisers must be set aside. The National Association of Broadcasters has a detailed set of standards for children's programs; respect for parental authority and good social behavior, special restrictions on adventure stories, avoidance of misleading or exaggerated statements are among the standards.[54] The code of this association also has provisions against one-sided discussions of controversial subjects, attacks on racial and religious groups, sensational treatment of news stories, and numerous other matters. All broadcasters may not follow the code, or show a high social consciousness as they control programs. Even so, radio service obviously has a social as well as a business side.

POSSIBLE SOLUTIONS OF THE SOCIAL PROBLEMS

Seeking to broaden the national policy for radio service, the federal government can alter the social conditions of broadcasting. Social and economic problems can be identified easily—an unequal geographic distribution of programs, excessive earnings for some stations and deficient returns for other broadcasters, extensive advertising, program duplications, and the low intellectual levels of much radio service. And alternative solutions of these problems, which are described in this section, can be outlined in a matter-of-fact manner. But the choices of right solutions are not so readily made in our democratic society. Knowing the variations in human judgments, Congress does not prescribe the radio programs of the country. Public ownership of radio stations or assessment of receiver-set fees does not have wide public support. Many people do not want all the advertisements and low-grade programs that are products of a private radio industry, but they are not yet ready to shift to public ownership. Even the simpler alternatives, such as commission regulation of programs and social uses of excessive station earnings, are not talked about. Since Congress seems to be satisfied with radio regulation as it stands, this section, dealing with several public controls of broadcasting, has no immediate governmental significance in the United States.

Public Ownership. A public system of broadcasting, managed through a government department or a public corporation, is the antithesis of the American system. Government participation in the radio industry can take a number of forms.[55] The central government may own all the stations, and put the management of the system under a government department. Or the government, as in Sweden, may build and operate the transmitting stations, but hire a private firm to manage the programs. Under another arrangement a company produces the radio service, but the government holds a majority of the shares of the firm. Sometimes the broadcasting market is served, as in Canada, by both private and public stations. A mixture of American and English methods of control, broadcasting in Canada is done by private companies, which are supported by advertising revenue and are regulated by a commission, and by a public corporation that is supported with receiving-set fees.[56] A public corporation is used to manage and finance some broadcasting in Canada because the private companies do not extend radio service to sparsely settled areas, and because the private stations give so much time to advertising. In the future the public corporation may acquire the private Canadian stations and give Canada a wholly national radio system.

The British Broadcasting Corporation is a notable case of one kind of public ownership—the public corporation.[57] Organized as a public corporation in 1927 after a private company controlled the new radio industry for several years, the BBC has an exclusive monopoly throughout Great Britain and northern Ireland. It is largely free from Parliament and politics; yet it does not have the customary marks of a private enterprise. A Board of Governors of seven men, who are appointed by the Crown on the advice of the Prime Minister, controls the BBC; and a Director General, who is selected by the Board, manages the organization. Unlike a government agency, the BBC is free to choose its employees and its talent; it is not required to hire civil servants. Although the Ministry of Information is authorized to forbid the transmission of some programs, the BBC usually is free to choose its programs. It is supported by receiving-set fees, which are one pound a year for each set, rather than by public funds. But the BBC does not get all the fees; the Post Office makes a deduction for collecting the fees, and the Treasury makes other deductions.[58]

As they control radio programs, the governors and officers of the BBC emphasize the national and cultural interests in British broadcasting. They neglect regional interests so much that six additional and autonomous public corporations are proposed for the country.[59] Cultural and educational improvement of the listeners is a primary purpose of the public system. As an American journalist puts it, the BBC ". . . can pace the nation's culture instead of playing down to it."[60] In part the listeners are given what the BBC management thinks they should have, not just what they want. Yet the management has only limited, inadequate contacts with the people.[61] To bridge some of this gap and to give a good cultural shape to the programs, the BBC uses advisory committees that determine what kind of spoken English is used and what kind of musical, religious, and other programs are broadcast. All speeches, even the political speeches, are edited; some of them are rejected. Trying to avoid political controversies and to keep its autonomy, the system is managed in a cautious manner; indeed, some listeners believe that it is often dull and tedious. It is not a venturesome organization that always tries to make more effective contacts with the people, tests new programs, and seeks better cultural results. Yet, despite the limitations of the BBC and numerous complaints against the programs, the British people do not seem inclined to abandon public production of radio service.

When broadcasting stations are publicly owned, they can serve broad cultural, educational, and national interests. The social usefulness of radio service extends beyond entertainment and profits. Commercialism in radio programs, particularly the advertising, can be eliminated altogether; unnecessary duplications of programs can be avoided; and a more nearly equal geographic distribution of service can be achieved, because the locations of public stations are not controlled by prospective revenue. And since fewer stations are needed to serve a whole country, the costs of broadcasting are lower than in a private radio industry. But most Americans are not yet so dissatisfied with private management that they are ready to turn to complete public control of their programs. Nor do the American masses want to substitute cultural and educational uses of broadcasting for the present entertainment uses; they want to make their own evaluations of radio programs. If they think at all about public radio service, Americans are likely to say that "politics" is the real danger. Perhaps they are right. At any rate, the public ownership of American radio stations seems to be a long way off.

Subsidies and Receiver Fees. The federal government can support some or all stations with general tax revenue or with receiver-set fees. Hoping to do something about the unequal distribution and extensive advertising of radio service but preferring to keep private ownership and management of the service, a government can pay the costs of all broadcasting. Government appropriations are substituted for advertising and other private revenue. Or the government can support only part of the stations. It can cover the deficits of those that are built to serve the sparsely settled areas, and still let every broadcaster try to get as much advertising revenue as he can. Another choice is assessment of receiver-set fees, a common source of radio revenue in other countries. Assessing an annual fee of $2 or $3 a set, the FCC has revenue that can be allocated to stations and networks according to their costs.* The receiver-set fees measure the listener price of advertising. But the fees are more than substitutes for advertising revenue: they also provide financial support for additional stations where rural families have inadequate service or no service today.

Listeners want to escape from radio advertising, but they show no interest in paying the costs of broadcasting. Receiver-set fees, like other fees and taxes, seem to be unattractive to most people. Nor are the people of metropolitan areas likely to approve fees that are high enough to pay broadcasting deficits in Western and Southern rural areas. Allocating funds to standard stations and to regions, a commission has responsibilities that are certain to reduce the privacy of the radio industry and to create some political friction. Before the commission can allocate revenue to a station or a network, it wants to know the necessary costs of broadcasting. The choices of programs, the salaries of the management and staff members, the office expenses, and payments to talent are among the cost variables. Making the allocations, the commission probably needs some control of program and managerial costs. Since the control of program costs involves selections of programs, the commission can be charged with censorship. And the demand for additional rural stations or special programs can put the radio administrators into more politics than they enjoy—more than they probably can handle efficiently. Controlled by these and other facts, the assessment of receiver-set fees is not a sure way to improve the social and political conditions of American radio service.

More Public Regulation. Additional federal control of stations and networks is another possible policy—apparently the only alternative that is attractive to most Americans. Different kinds of regulation can be used to solve the several social problems—geographic distribution of service, advertising, duplication of programs, and program content. First, the FCC can use the present licensing powers to provide more broadcasting service for the people who live in rural areas, particularly the thinly settled regions. High-power stations, using as much as 500 or even 1,000 kilowatts of power, can be licensed. But these stations go against the American interest in local expression, and they disturb the present distribution of broadcasting rights. More clear-channel and strong regional stations can be created, though such changes are opposed by local station owners and are limited by the available advertising revenue. Possible revisions of broadcasting rights seem to be nearly exhausted,[63] but frequency modulation offers prospects for more rural as well as urban stations. Being a cheaper means of broadcasting than the present AM service,[64] FM stations are certain to be built in some small cities that never have had stations. Yet the FM broadcasting, like the AM service, also is certain to be limited by the available advertising revenue.

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* The total income from a $2 or $3 annual fee probably is large enough to pay the present costs of stations and networks. At least it approximates the prewar revenue from radio advertising that apparently provided large returns for some stations and networks,[62] though it is not so large as the wartime revenue. If enough revenue from the fees is not available to support the present broadcasting and to subsidize some new stations in rural areas, then the commission can eliminate some of the metropolitan stations.

The scope of regulation can be broadened to include all companies that transmit radio programs. Networks can be put under regulatory control, and can be licensed as broadcasting stations now are. Distributing leading programs throughout the nation and regions, the networks naturally influence the program standards of broadcasting; doing much of the national radio advertising, they negotiate the largest advertising contracts in the industry and receive much advertising revenue; and choosing outlets where they please, they can give or withhold radio service to listeners. Any one of the four national networks is a more important part of the radio industry than any single licensee of the FCC. The FCC not only needs the customary licensing control of networks, but also needs authority to require the extension of network service to any broadcasting station. Given this extra power, the FCC can distribute network programs to more low-power, rural stations. In addition the FCC can be given extensive control of network affiliation contracts, and can be authorized to regulate the distribution of revenue between the network organizations and outlet stations.

Other areas of regulation are radio programs and advertising. Perhaps no American commissioner wants to construct program schedules, determining the full limits of what the people hear. Nor is any commission likely to be well qualified to make these choices. Considering political conditions and listener freedom, Congress can justify the general rule of giving the audiences what they want, and leave the selection of most programs to the private broadcasters. But the amount and kind of advertising, length of some programs, and general program standards seem to afford opportunities for workable regulation. Radio advertising of some products can be banned. The length, frequency, and content of commercial announcements can be controlled by commission rules. Testimonials, long advertising announcements, repetition of the same announcements week after week can be restricted or eliminated. If a commission does no more than clean up the advertising, it makes an improvement in broadcasting service. Some advertising still is necessary, however, as long as the broadcasters have no other large sources of revenue. Working to improve the children's programs, newscasts, dramas, opportunities for speakers and other radio uses and considering the cultural influences of broadcasting, the commission also prescribes some general moral and aesthetic standards for programs. The present code of the broadcasters offers a good starting point for advertising and general program controls. At least a commission cannot be accused of unreasonable censorship if it makes all broadcasters conform to their own code.

Finally, earnings regulation of broadcasting stations and networks is another possible kind of social control. Endeavoring to improve the geographic distribution of programs, or to temper the commercialism of radio service, the commission can limit the advertising revenue or recapture the earnings of broadcasters who have excessive returns.[65] One method is a restriction of commercial programs. Having more than a reasonable return, a station or network is ordered to reduce its advertising clientele and to increase its noncommercial programs. Some advertising is eliminated, but no change occurs in rural radio service. Another method involves a redistribution of broadcasting revenues. Recapturing the excessive returns of prospering networks and the high-power stations, the commission provides funds for additional rural stations or better programs from established rural stations.* Revenue from urban broadcasting locations is used to support the expansion of rural service. When the recapture method is used, the commission unquestionably is harassed by many "hand-out" requests from small stations, and is certain to make some mistakes as the recaptured earnings are distributed. Yet this is an economical way to improve the distribution of radio service. At least one of these earnings controls is a necessary part of a public program that translates the private radio earnings, derived partly from favorable broadcasting locations and license privileges, into service benefits for all listeners.

* If the whole excess of earnings is recaptured in any year, the company may reduce its "time" rates, give away service, and prevent a redistribution of earnings. A sliding scale of earnings recapture is a possible answer for the problem. Another answer probably is not attractive to either the broadcasters or the commission: regulation of the charges that are made for commercial time.

Chapter 24

An Introduction to Price Structures

THE POINT of focus of most commission regulation is evident: it is the reasonable earnings of individual utility companies. All other regulatory problems are secondary to the price levels for utility services. A reasonable valuation of used and useful property, the fair rate of return, and the reasonable depreciation cost—these are the main dimensions of price-level regulation. Yet the prices of utility services clearly are complementary to the earnings. Commissions know that reasonable prices give a company a reasonable amount of earnings, but they do not study the relationship of prices and earnings closely. When a company has excessive earnings, the commission orders a reduction of some prices; and if the earnings are deficient, an increase in some prices is allowed. Careful attention commonly is not given to the revenue effects of price changes—to the elasticity of demand. Simplifying their administrative work, commissions ignore possible changes in buyer purchases as prices change; they assume that the sales at old prices still can be made at new prices. And when companies sell utility services at several different prices, commissioners do not ask themselves how many different combinations of prices can bring in the reasonable earnings, and what is the best combination of prices. Commissions usually avoid puzzling relationships of reasonable earnings and prices, particularly the relationships of earnings and demand behavior and alternative choices of price structures.

Control of price differentiation is the important problem of price regulation. Most utility services are not sold today at uniform prices for each output unit and every buyer. When they started to operate and sold service for one or two uses, uniform prices were used. But when the uses of service and the demand increased, they began to differentiate prices. This was true particularly in the telephone, gas, and electric industries. Given much freedom to choose prices for new kinds of service, the utility companies developed highly differentiated price structures. Buyers were classified and prices were differentiated according to the uses of service; and within a single classification of buyers, some customers received price discounts as their consumption of service increased. Commissions did not carefully shape the development of these price structures. Now they have a special problem of the relationship of earnings and prices: how much should each buyer class and each individual buyer contribute to the reasonable earnings of a company? If the social purposes of regulation are considered, what combination of differentiated prices is the best means of giving the company a reasonable amount of earnings? When earnings are excessive, what group of buyers should obtain price reductions? And when a company has deficient earnings, who should pay the increases in prices?

The price structure of a public utility company is supposed to conform to several rules. The prices of a firm are chosen so that the total revenue covers the total cost of service—operating expenses, depreciation cost, and fair return. Or if no choice of prices equates total revenue and total cost and the company cannot obtain a fair return, then the price structure is arranged so that the deficits are minimized. Second, differentiation of public utility prices is an accepted public policy, though the companies are not allowed to choose any kind of price differentiation. A difference in service costs is an approved basis for price differentiation; yet accurate cost measurements for different units and different kinds of service rarely can be made. There are some tolerable but indefinite limits of discriminatory pricing. "Unreasonable" or "undue" discrimination is prohibited, but the companies often are allowed to differentiate prices according to some demand differences. Seeking more consumption of utility services, commissions encourage price differentiation that is based on the differences in buyers' demands. Third, the price schedules must be understandable to the consumers. Given the rate schedule and the amount of consumption, a literate customer should be able to compute his bill. Fourth, as a managerial consideration, the customer classifications and price schedules should be easy to apply and to administer.

SEVERAL CONDITIONS AND OBJECTIVES

Serving as a brief introduction to pricing problems, this chapter does not sum up all the facts and present an extensive analysis of utility price structures. It contains background material for later discussions of price differentiation. Several general conditions and general objectives of the present pricing policies are discussed, but no complete statement of pricing practices is attempted. These conditions and objectives have a bearing on the price differentiation, particularly the discriminatory differentiation, that is described in the following chapters. Some conditions are conducive to price discrimination: the managers of utility companies usually select the new service classifications and new price schedules, the fixed costs and joint costs of production cannot be translated readily into unit costs that can be used to determine the price differentials, and "increment" costs often control the choices of new prices. Even the commissions have policies that allow price discrimination; they want to encourage enlargements of service consumption, they accept the "value of service" as a basis of price differentiation, and they seldom upset the established patterns of price combinations as the earnings are increased or decreased. Yet the commissions, considering the social effects of pricing practices now and then and insisting on simplified and understandable price structures, limit the price discrimination of the utility companies.

Price Fixing by Management. As utility price structures developed, the companies initiated most of the price changes. Management led in pricing decisions; the regulators followed. Seeking more earnings, the companies reached out for new kinds of service and a larger consumption by the average buyer. These companies gradually broadened their differentiated price structures as their markets expanded, giving price discounts to new buyers or to old buyers who enlarged their consumption, and thereby increasing their earnings. Controlled by businessmen, the price differentials were based on private rather than social considerations. Commissions had many chances to revise these price structures; every time they ordered a reduction or an increase in companies' earnings, they had such a chance. After price differentiation increased the earnings of utility companies, the commissions could use the new excessive earnings to reduce the prices of the buyers who did not get any price discounts. Earnings control was a way to move toward uniform prices rather than more differentiated prices. The regulators neglected this opportunity. Failing to understand the nature of discriminatory pricing, they followed the business pattern of pricing. And the price differentials remained and sometimes were enlarged.

Utility companies insist, in fact, that the choice of prices is a managerial function. Firms are willing to submit to earnings regulation; even though they commonly oppose earnings reductions, they recognize a commission's statutory authority to regulate the reasonable depreciation costs and the reasonable returns. But they want to keep control of price differentiation, particularly the new prices. The choice of price differentials is properly left, they think, to the men who own and manage utility companies. Just as these firms were reluctant to relinquish control of accounting or financial transactions, so they are unwilling to give up their nearly complete control of price differentiation. It is a valuable power. Having it, the companies can offer price reductions where increases in earnings are expected, where the expected increments in revenue exceed the expected increments in costs. Perhaps the company managers should have some control of prices—at least those for new uses of service. When development of a new service is contemplated, the managers usually know better than the commissions what prices can "get the business." And they certainly know more than the commissions about the prices and revenue increments that justify further investments in a new service. But the commissions need not defer to managers in all pricing decisions; otherwise the discriminatory pattern of pricing grows and is never subjected to social control.

Cost of Service. If a common rule of price control is followed, the prices of different services are supposed to be determined by the costs of the services. This is not an absolute rule. If the commission and the company wish to increase the sales of a utility service, they must give some attention to the demand for the service; the price of each differentiated service cannot be equated to the average cost of the service.[1] The cost standard is the general rule; it is the standard to which adherence is expected in many but not all pricing situations. Yet the cost standard is difficult to apply, because cost differences between kinds of service are not easily measured. There is no competitive market for utility services in which the prices of the services approximate their production costs. Instead, each company usually is treated as a separate, isolated case for the maintenance of cost-price relationships. Lacking markets in which the costs of different services can be measured as they are under purely competitive conditions, the companies and commissions must make their own studies of cost behavior. Under these conditions some arbitrariness is unavoidable in cost computations, particularly when either the regulators or the managers have preconceived ideas of what the costs and prices of different services should be.

Overhead costs of utility services are among the thorns that scratch anyone who attempts to disentangle the cost data. Even a general distinction between prime or variable costs on the one hand, and overhead or fixed costs on the other, is not easily stated.[2] According to the conventional distinction, the variable costs change in proportion to current output changes, and the overhead costs do not. Overhead costs commonly are associated with long-term investments in durable equipment; variable costs commonly are connected with expenditures on labor and raw material. Anticipating the profitable production of additional service, a company invests in more durable plant. Since a company has plant capacity in which it once invested money, it can produce service now. The investment costs of production obviously do not vary with the current output; they are long-period costs and are connected with the anticipated outputs and the anticipated profits. Translated into current or annual costs of production, the investment costs are the overhead costs (e.g., depreciation expense and investor return) of current production. Utility companies have large overhead costs—larger as a general rule than variable costs of current production. This is true, because they have large investments in the durable plants with which the overhead costs usually are associated.

The distinction between overhead and variable costs depends on the way in which the "service unit" is defined. As one writer observes,* "It is quite meaningless to say that costs are overhead unless it is expressly stated for what units of product they are overhead."[3] If, in the case of railroad service, the service unit is the passenger-mile, then the cost of coal is an overhead cost of carrying individual passengers. But when a train trip is the service unit, the cost of coal is a variable cost for a single trip over a route. The maintenance costs of an electric distribution line are overhead costs of the service that is distributed along the line; but they are variable costs of the whole-system operations. Likewise, the wage and gasoline costs of an urban transportation company are overhead costs of hauling individual passengers, though they are variable costs for single bus trips when the company can control the number of trips. A further distinction can be made between regular service costs and the costs of off-peak service. Building a plant to serve everyone, a company has unused plant capacity during some hours, days, or seasons.† Overhead costs are figured for the utilized plant, for the planned or regular production; they are not computed commonly for the idle plant, for the irregular or off-peak service. These costs also have a time dimension. The organizational costs of a utility company are overhead production costs throughout the life of the company; the investment costs of depreciable equipment are overhead costs during the life of the equipment; and the wage of a clerk or a lineman is an overhead cost of service for a day or week or month. Overhead costs of utility services clearly cannot be measured in a simple, singular way, because they are affected by definitions of the service unit, the time dimension of operations, and the kind of service.

Joint Production of Utility Services. The costs of utility services also are affected by the joint production of the services. To economize the costs of production, companies commonly produce two or more services with the same plant. An electric firm, for example, incurs a lower total cost if it serves residential, industrial, and other buyer groups from the same plant, than if it constructs separate plants for each buyer class. Some economies of large-scale production are lost when separate plants are used.

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* Quoted by permission of Oxford University Press from H. E. Batson, *The Price Policies of German Public Utility Undertakings*, p. 63.

† The off-peak buyers are served at the times, such as the early morning hours, when the regular buyers have low demands for service. They buy what is essentially a by-product of the basic plant service.

There are also losses of some diversification economies; separate plants must be large enough to meet the peak demands of each buyer class, but the several peak demands, occurring at different times, can be dovetailed with a single plant. Since the buyer demands are diversified, a single plant economizes the company investment in productive equipment. But while joint production economizes the operating and investment costs, it creates another complex problem of cost determination. There is really no unchallengeable way to allocate joint costs (to allocate the economies of joint production) to the service classifications, to individual buyers, or to single service units.

Joint production of utility services is a product of the buyer classifications that the companies set up. Electric service, for instance, is differentiated according to domestic, industrial, retailing, street-lighting, and other uses. The joint output of utility services, consequently, is not the same thing as the classic cases of joint production of agricultural products —of cotton and cotton seed, oats and straw, bacon and other pork products. Joint output of agricultural products and minerals is a result of the natural, technical character of the production processes. It is simply a natural fact that a cotton boll has seeds and some cotton in it. On the contrary, joint production of utility services is a result of managerial decisions; it is a creation of men—money-making men—rather than of nature. Seeing different uses and different demands for their services and anticipating increases in earnings from price differentiation, the managers classify buyers. In this situation the joint production of utility services has a managerial origin. It is associated with a consciously planned pattern of discriminatory pricing.

Joint utility services do not have the same complementarity as that of the jointly produced minerals and agricultural products. Complementary production of two or more commodities occurs when more production of one commodity also provides a larger output of the other commodity or commodities. Fixed quantities of rib roasts, round steaks, and other meat cuts are obtained from a steer. And blade roasts cannot be processed into rib roasts, round steaks cannot be turned into porterhouse steaks, and so on. Unless new kinds of cattle are developed, there is only one way to get more porterhouse steaks: raise more cattle and produce more rib roasts, round steak, and other beef cuts.

A strict complementarity is not found in the production of utility services. To produce more electricity for industrial buyers, a company can build a plant that produces no service for other buyers. And technical conditions do not prevent a production shift from industrial service to domestic service; the production of one service can be substituted for another service. Yet utility companies do not shift plant capacity to one class of buyers, and deprive other consumers of service. As long as a class of customers demands service at the prevailing prices, the firm continues to provide the service regardless of the profits that are foreseen in some other markets. The peculiar obligations, particularly the obligation to serve all who come, assures continuous service for separate buyer classes, and prevents more than a small amount of substitutive production. Even if utility services can be produced separately, they commonly are produced jointly.

To maintain a cost-price relationship for each utility service, companies and commissions must compute the total joint costs and then allocate these somehow to the jointly produced services. Not all production costs are joint costs. Some costs, which are called "separable" or "nonjoint" costs, are incurred to produce each separate service. Among these are the depreciation, reasonable-return, maintenance, and tax costs for equipment that is used exclusively to perform one kind of service. An electric distribution line often provides service for only one customer group such as farmers or domestic buyers; or a separate gas main sometimes is installed to serve large industrial consumers. And some labor costs, including some clerical and managerial salaries, are incurred altogether for service to a single buyer group. But many other costs are joint costs of production. Costs of electricity generation, gas manufacture, and water storage in reservoirs as well as the transmission costs of electricity, gas, and water are chiefly joint costs. Managerial costs, too, commonly are joint costs of production.

The joint costs of production usually can be identified, but they cannot be allocated readily to separate services. Any allocation of joint costs is, indeed, an arbitrary allocation.[4] It is a managerial or regulatory judgment about the "right" allocation. When several kinds of consumers use the same equipment, joint production of the several services is more economical than separate production of each service. The joint costs of production, like the economies of joint production, are associated with the composite output. To allocate the joint costs to separate parts of the composite output, the company or commission must find a way to allocate the joint production economies to the separate outputs. That is impossible, because joint production economies are taken out of context—out of their environment of composite production—as soon as an allocation is made. No one can say just how much operating expense and investment cost are incurred to provide service for each consumer group.

Even though they are arbitrary measurements, joint cost allocations are made. Managers and rate engineers of utility companies do not hesitate to allocate joint costs to the separate classes of service, or even to the different kinds of customers within a single buyer classification. They want to prove that the price differentials are determined by cost differences, that the price structures and price schedules are nondiscriminatory. They usually allocate the joint costs according to the demand differences of buyer classes. These costs are treated as functions of demand, not of output or production economies. A demand basis of cost allocation involves circular reasoning. Just as the price defferentials are determined by differences in buyers' demands, so the joint allocations are determined by the same or similar differences in demand behavior. These cost manipulations do not prove that cost differentials determine the price differentials, that no price discrimination is practiced. Yet they often are accepted by commissions, and serve to cover up the discriminatory pricing.

"Increment" Costs. When the utility companies developed their price differentiation, they commonly did not make joint cost studies. The prices for new services were not equated to the average costs for the services, including something for the joint production costs. Joint cost allocations usually were made after the new prices were chosen; they were used to defend price differentials, not to determine them. But the companies took account of costs as new service prices were chosen. They computed the new service prices so that the expected increment in total revenue exceeded the anticipated increment of total costs. Profit anticipations controlled the price decisions.

A monopolistic standard of pricing usually seemed to regulate the choice of each new price. Aiming to increase their net earnings, companies wanted to develop a new, differentiated service only when the increment in revenue was likely to exceed the cost increment. Managers and rate engineers of utility companies spoke of and measured the "increment" cost, not the average cost. The increment cost of a service is not quite the same thing as the economist's notion of marginal or incremental cost.* Marginal cost, a general concept of cost behavior, is the increase in total cost that is incurred to produce an additional unit of output. The marginal cost of the x^{th} unit is total cost of x units less the total cost of x-1 units.† And a marginal-cost curve measures the successive additions to total cost as each additional service unit is produced. But increment cost, a workable adaptation of marginal cost, is the increase in total cost when several or many additional units of service are produced. It can be used in connection with a large output change—even a whole new classification of service. And when new investments must be made before the output can expand, a utility company can include the new investments in the increment cost; a cost increment can be computed for the estimated service-life period of the new equipment. Or an annual cost increment, including the annual depreciation charge and the annual return on the new investment as well as annual labor, raw material, and tax costs, can be calculated.

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* Nor is this monopoly price determined in the same way that an economist usually expresses the measurement of a monopoly price. To maximize the monopoly return, the economists' monopoly price is determined by the equation of marginal cost and marginal revenue. The marginal cost and marginal revenue are measured for each unit of output. On the other hand, the cost and revenue increments, which are used by utility-company managers, are lump sums. Yet, when the companies seek the largest possible increment in net earnings and accurately anticipate the revenue and cost increments, their monopoly price is the same as the economists' monopoly price.

† For a further discussion of marginal or incremental cost see Chap. 20.

Successive increment costs apparently are measured or estimated at different points of time. They represent chronological changes in total production costs. Starting with one class of service, an operating plant, and an established business organization, a company can measure or estimate the cost increment for a new service; then, at a later time, another cost increment can be computed for a third service classification; and, at a still later time, a further cost increment can be calculated for another additional lump of service. If a company has A, B, and C service classifications, the increment cost of the B service is the total additional cost beyond the total cost of A service, and the increment cost of C service is the total cost change above the total cost of A+B service. These increment costs measure the minimum revenue increments which companies want before they can afford each new classification of service. Using them, a company has a cost basis for monopolistic price differentiation that does not require joint cost allocations.

The size of the cost increment depends not only on raw material prices, wage rates, and tax costs, but also on the kind of new service, the unused plant capacity, and the estimated service life of new equipment. Sometimes the cost increment, including the depreciation cost and the investor return, is large; at other times the cost increment, including mostly raw material and labor costs, is small relative to the output increment. An electric company, let us assume, is utilizing the whole generating plant when the peak demands of existing buyers are satisfied. To develop rural electrification service or some other additional service, this company must invest in more generating plant as well as service lines. Some new services may not require additional investments in transmission and distribution lines, but they may necessitate new investments in additional generating plant. The annual cost increments for these services include some depreciation, maintenance, and investor-return costs for new, durable equipment. On the other hand, the firm may have unused plant capacity with which some or all of the new service can be performed. If so, the increment cost can be small unless the company managers take account of the future replacement costs of the unused plant. Treating the past plant investments as sunken costs of production, a firm incurs large increment costs only when large new investments must be made as the output is expanded.

The increment cost of an off-peak service usually is small. All utility companies have unused plant capacity during off-peak periods—during the seasons or the hours when the consumer demand for regular service is low. If occasional investments in special equipment are excluded, the increment cost of off-peak service consists largely of raw material and labor costs. To provide service during early morning hours, an electric company incurs chiefly the cost of coal, some plant maintenance, and some labor. This firm can afford to sell electricity at nominal prices during the off-peak periods, unless the off-peak sales increase rapidly, create a new peak demand, and necessitate new investments in generating and distribution equipment. When the revenue increment from off-peak service exceeds the cost increment of the service, the earnings of the company increase. Similarly, the Bell system, possessing enough long-distance circuits to serve anyone who wants telephone service during the daytime hours, incurs only small cost increments for toll calls during the evening hours and on Sundays. A reduction of toll-call charges during off-peak periods is profitable.

Most commissions approve the prices that are controlled by the increment costs of service production.[5] At least they rarely restrict managerial use of this cost-price relation. Following the thoughts of utility-company managers, commissioners like the prospective addition to profits—the difference between the anticipated revenue increment of a new service and the anticipated cost increment of the service. These additional earnings can be used to reduce old prices. But increment-cost control of price differentiation is not always acceptable to the New York Commission. A New York electric company proposed low, off-peak rates for water-heating service. Rejecting the proposed price differentiation between on-peak and off-peak service, the commission said that

> By the increment cost method, almost any figure can be justified for any single consumer or small class of customers. . . . In other words, the increment cost method produces amazing results if one can only shift to somebody else the large basic costs for providing and operating a system while charging a given service only with the cost of production of electric energy.[6]

And in a later case, where a company used increment costs to determine a street-lighting price, the same commission said, "The consumers in each class of service will naturally insist that their service should be billed on the increment-cost basis, for they would thus obtain lower rates than could possibly be obtained on any other cost basis." [7]

Condoned by most commissions, increment-cost control of price differentiation usually is not the subject of legal controversies. Only two Supreme Court decisions concern an equation of increment cost and prices. This was the main issue in the Northern Pacific case of 1915.[8] Seeking the development of lignite coal deposits, the state of North Dakota ordered the railroad company to base coal rates on the "out-of-pocket" costs of coal transportation. Rejecting the North Dakota argument that overhead railroad costs must be paid regardless of lignite coal transportation, the Court said,

> It is not a sufficient reason for excluding such . . . expenses to say that they would still have been incurred had the particular commodity not been transported. . . . The State cannot estimate the cost of carrying coal by throwing the expense incident to the maintenance of the roadbed, and the general expenses, upon the carriage of wheat. . . .[9]

One fact about the increment-cost control of prices was settled: the state of North Dakota could not fix prices that equated the revenue increment to a small cost increment. But the Court did not say anything about the right of the company to use such a means of price differentiation. The company's control of prices was not an issue in the case.

In the other case, the Colorado Interstate Gas case of 1945, the Federal Power Commission wanted to reduce the earnings of a natural gas company.[10] The commission was authorized to regulate the wholesale rates of gas-transmission firms that operated in interstate commerce, but the natural gas sales to industries were not subject to any public control. Part of the business of a company was regulated and another part unregulated. This was a complication of earnings and price regulation. Computing the reasonable wholesale earnings and prices of the Colorado Interstate Gas Company, the Power Commission had to determine how the total costs should be divided between the regulated and unregulated businesses. If the industrial sales were treated as incidental business and were charged only their increment costs, the regulated business carried most of the costs and the rate reduction was minimized. This means of cost allocation was preferred, of course, by the company. The Power Commission believed, however, that the pipe line produced service jointly for industrial and wholesale customers, that some overhead costs should be allocated to the unregulated business. And the Supreme Court accepted the joint cost allocations of the commission. Only Justice Jackson, who wrote a concurring opinion on the case, had anything to say directly about the increment-cost method of price control. The gas price for a Colorado steel company or any other large industrial buyer was controlled by two conditions: the costs of alternative fuels that fixed the maximum limits for the prices, and the additional or increment costs of the industrial business that fixed the minimum price limits. "But I do not think it can be accepted as a principle of public regulation," Justice Jackson said, "that industrial gas may have a free ride because the pipe line and compressor have to operate anyway, any more than we can say that a big consumer should have a free ride for his coal because the trains run anyway."[11]

Value of Service. Courts and commissions do not say that prices always must be equated to some costs of service. Utility companies can choose prices that are equal to the "values" of their services. In the Smyth v. Ames decision the Supreme Court said,

> What the company is entitled to ask is a fair return upon the value of that which it employs for the public convenience. On the other hand, what the public is entitled to demand is that no more be exacted from it . . . than the services rendered . . . are reasonably worth.[12]

In this decision the cost of utility service seems to be counterpoised to the value of the service. But the meaning of the value of service is not defined. The Supreme Court does not say how the value of service can be measured; nor does it tie up value of service with price differentiation. Until commissions and companies disagree more completely on price differentiation and until the Supreme Court must fix the legal limits of price differentiation, the official meaning of the value of service is certain to be unclear.[13]

The value of a service can be measured objectively by the buyer demand for the service. If so, it can be represented by the prices that a group of buyers are willing to pay for various quantities of service. Most commissions do not see a direct connection between the consumer demand and the value of service, though some commissions recognize that the value of service increases or decreases with the buyer demand. When the incomes of consumers decrease and utility companies begin to lose customers, the Wisconsin Commission believes that the value of service also decreases.[14] If value of service is defined as the prices that buyers are willing to pay for service, then price differentials are based on demand-price differences rather than cost differences. Then a value-of-service standard for prices is a discriminatory standard. If some buyers, as described in later chapters, have an elastic demand, they receive price reductions while other buyers, who have a price inelasticity of demand for service, do not get price reductions. Seeking increments in total revenue, an acquisitive utility company attempts to reduce the prices for buyers who have an elastic demand, and to increase them for those having an inelastic demand for service.

There is a regulatory limit for price discrimination. Commissions usually say that they do not permit "undue" or "unreasonable" discrimination between buyers—apparently another derivative of common law of which public utility regulation has quite a few. They do not say just what "undue" or "unreasonable" discrimination is. Their tolerance of company pricing policies allows much price discrimination, indeed, to pass for "reasonable" discrimination. Yet, even if commissions never define "reasonable" price discrimination, they do not allow unlimited discrimination. Consequently the value of service cannot be precisely defined as the demand for service. In regulatory action the value of service is an ethical concept; it is what the commissions think the buyers should pay, not an objective or market-place measure of the customers' willingness to buy at various prices. Looking at the prices of other companies, a commission can judge the reasonableness of a company's price structure.[15] When one firm has a price structure different from that of most other companies, a commission may decide that it practices "undue" discrimination between buyers. Or perhaps a reasonable price is one that most families and enterprises can afford to pay.[16] If extensive service consumption is a result of reasonable price differentiation, a reasonable residential price for electricity is one at which most families can afford to purchase some electricity. The value of service, nevertheless, still seems to be an unclear, loose concept in regulatory action.

Enlargement of Output. Commissions approve price changes that increase the consumption of utility services. They want to widen the limits of consumption, extending the geographic margin of the services, increasing the uses of utility services, and enlarging the per capita consumption of the services. They like what are called "promotional" prices, because these prices attract new buyers or induce old buyers to consume more service. Setting an objective of enlarged consumption, commissions accept some of the pricing policies that originate with the managers or company engineers. Companies are allowed to select new service prices so that the revenue increment exceeds the cost increment. And discriminatory price differentiation, based on demand-price differences between buyer classes, is acceptable to most commissions. Through price discrimination companies get more earnings while commissions get enlargements of service consumption and opportunities to turn the new earnings into price reductions at later times.

Both the companies and commissions are interested in the price elasticities of demand that different buyer groups have for utility services. If price reductions are given to any buyers, the companies prefer to give them to consumers who are willing to make larger expenditures on the services. The firms desire increments in total revenue, while the commissions, too, seek to give price reductions to those who buy more service. The best promotional price change is the one that effects the largest possible increase in service consumption. Given these conditions, the commissions and companies can agree on price revisions; both of them prefer price reductions for the consumers who have an elastic demand. With such reductions, the companies get an increase in total revenue, whereas price reductions under inelastic demand conditions result in a revenue decrease. And commissions get a larger consumption increment when price reductions go to consumers with elastic rather than inelastic demands such, for example, as house-heating consumers of gas rather than to cooking consumers of gas.

Consumption of service is affected by the way in which price schedules are constructed for individual buyers. A price schedule can be constructed so that a buyer is induced to increase his purchases. Prices can be differentiated according to the amount of each buyer's consumption. Prices can be scaled so that, as consumption increases, prices decline for the successive increments in a buyer's purchases. A buyer can purchase a certain amount at one price for each unit; after he purchases the first quantity, he can purchase another group of commodity units at a lower price; and so on for further purchases. This form of price differentiation can be called "quantity-discount pricing." Quantity discounts are well known to Americans who habitually ask the price for two or more units of a commodity, expecting lower average prices as larger amounts are purchased. This characteristic of public utility pricing is so common that the commissions, like the companies, consider it a prime requisite of a price structure. And quantity-discount schedules of prices, which most commonly are "block" schedules, are praised as good promotional forms of pricing.

Relation of Earnings and Price Control. A structure of prices has another important characteristic: the prices are chosen so that the company obtains enough revenue to cover the reasonable costs of service. At the time of an earnings investigation a utility firm is selling differentiated services, of course, at certain prices. The commission determines whether the company's earnings at these prices are reasonable or unreasonable. If the present earnings are excessive, the commission reduces some or all of the prices in the price structure. Prices are chosen to cover the fair return for the investors, a reasonable depreciation cost, and a miscellany of company expenditures that are not often subjected to careful regulatory control. Aiming to equate the total revenue and reasonable service cost, the commission must scale down the price structure when the company earnings are excessive, or raise it when the earnings are deficient.

The commission knows how much total revenue is desired each year from the price structure of a company. It is the amount of revenue that promises to give the firm a reasonable amount of earnings. More than one price structure probably can provide a reasonable amount of earnings for a regulated firm. Recognizing this fact, the commission has a choice between different combinations of prices. Let us imagine that a company has A, B, and C classifications of consumers, and that these buyers are paying average prices of 10, 8, and 5 cents respectively for utility service. Charging these prices, the company receives a Y amount of total revenue. But the same amount can be obtained from other price combinations. If, for instance, the price of A service is reduced to 9 cents a unit while the prices of B and C service are increased, the company still may be able to obtain a Y amount of revenue. Such possible variations of price structures are important conditions of price control. Keeping the same reasonable-earnings objective, commissions can widen or narrow the limits of price differentiation. As they control price structures, commissions can determine what part of reasonable service costs shall be paid by each class of consumers. And they can determine whether price differences shall be controlled predominantly by cost differences or by demand differences.

Commissions rarely consider the alternative price structures with which a utility company can obtain a certain amount of total revenue. Their attention is focused mainly on reasonable earnings control and a reasonable *price level;* control of price differentiation is a secondary or incidental problem. When an earnings reduction is ordered for a utility company, the commission must choose the prices that are reduced to bring the earnings of the firm down to the new level. A part of the price structure can be reduced. All residential buyers or only the large residential consumers, for example, may receive the price reductions. Or, as another solution, blanket price reductions can be ordered so that all buyers share the earnings reduction. Sometimes the commissions offer a large share of the price reductions to buyers who seem to be most willing to increase their purchases. At other times they give price reductions to small, low-income buyers or to buyers who have fixed consumption habits. But they seldom undertake general investigations of differential pricing, studying the most desirable revisions of prices.

Having expedient policies for price control, most commissions do not wish to upset price structures that are established and that are a part of the working organizations of utility companies. Not wishing to stir up troublesome regulatory problems, they are content to let sleeping dogs lie. Companies naturally are accustomed to price structures that are accumulated gradually over the years. Buyers, too, are adjusted to the prevailing price differentiation. Some buyers own appliances and are habituated to the low-priced service; others are reconciled to the high-priced service. If commissions undertake general revisions of price structures, their decisions are attacked by the companies and by the buyers whose prices are increased. The uncertainty of sales under the new and untried price structures disturbs the companies. At the same time the buyers, whose prices are increased, object to the larger expenditures that they must make for utility service. If, for instance, commissions reduce the price differential between the cooking and house-heating uses of gas, the house-heating buyers complain against an increase in heating costs after they purchase expensive gas furnaces. Attacked by companies and some classes of consumers, the commission is in an uncomfortable position; a general revision of a price structure often does not seem to be worth the administrative trouble that it creates.

To avoid conflicts with buyers and companies, utility commissions usually accept the established price structures. They accept the price structures that have long histories and are controlled by private earnings objectives. After a company decides to sell a new service at a certain price because the expected increment in revenue exceeds the expected increment in total cost, this price may be retained indefinitely in the price structure. From time to time the commissions have an opportunity to revise the basic price structures. Each time the earnings of a company are reduced or increased, the basic price structure of the firm can be adjusted. But the commissions do not have any general, reasoned way by which earnings reductions or earnings increases are distributed among the different kinds of buyers. Lacking a general pattern for price structures, most commissions distribute earnings changes among the classes of buyers as each case arises. Political and administrative expediency seems to guide the regulatory action.

Simplification of Price Structures. Plainness and clarity are further requirements of utility prices. This does not mean that the simplest possible prices are chosen. It does not mean that prices are as plain and readable as the price tags on most retail commodities. As any history of price-structure development shows, the prices of utility services, particularly in the electric and gas industries, are far more complex than they once were. Uniform prices for each unit of service are rarely used; they were replaced many years ago by more "scientific" price forms. Two-part and even three-part prices, minimum bills or service charges, price schedules that decrease as consumption increases—these and many more complexities are found in the present price structures. A policy of price differentiation explains the transition from plain prices to complex price forms. If companies are willing to forego price differentiation, then uniform prices can be charged for all units of service. But neither the companies, nor the commissions, nor even many consumers are willing to give up the advantages that they see in price differentiation.

Thinking of consumer reactions, companies and commissions do give some attention to plain and understandable prices. The prices are supposed to be simple enough for an average buyer to understand them. If the average buyer cannot easily compute his total bill when he knows the amount of his service consumption, the price schedule is too complex. As the company managers know, a customer who cannot easily read a price schedule is likely to be a complaining, dissatisfied buyer. Moreover, an old price form, to which buyers are adjusted, is usually preferable to a new one unless companies can foresee some substantial increases in their earnings. A small increment in earnings, which can be taken away sometime by commission regulation, does not compensate for poor consumer relations. And price schedules are chosen so that the reasons for price differentiations and price complexities can be explained to the buyers. Commissions believe that the buyers have a right to know why a price form is selected. Perhaps the explanation is not always the true one (e.g., price differentiation is never explained as discriminatory pricing). But it must be an explanation that the consumers accept. Some buyers understand and accept more complex price forms than are accepted by others. Domestic consumers and other small buyers have the simplest prices; the large industrial buyers, who are expected to have more understanding of prices than any other buyers, have the most complex prices. Yet, even the most rational and intelligent buyers have readable price schedules, and are not subjected to unlimited price differentiation.

Chapter 25

Managerial Control of Prices

WHEN A company is subjected to public utility regulation, it does not lose all its managerial authority. Legislatures and commissions leave far more managerial discretion with the companies than they take away. Before 1930 the executives of utility firms managed security sales and accounting practices in most states. Today these executives still choose service standards, select technical improvements, and direct investments in utility operations; they control the expansion and efficiency of utility firms. And commissions do not closely scrutinize most expenditures of utility companies. There is another important managerial power which often is not noticed: the determination of pricing policies. Commissions control price levels, fixing the reasonable costs of service and reasonable earnings. But the price structures and the general shape of price differentiation are managed largely by private companies. Electric, gas, telephone, and water companies classify customers and develop price schedules. These firms voluntarily give price reductions to some buyers, and devise price schedules that induce more consumption of utility services. Executives and rate engineers of utility companies initiate new pricing policies, and count price structure control among their managerial functions.[1]

THE GENERAL CONCEPT OF MONOPOLY PRICING

Creating new classifications of consumers and forming differential patterns of prices, the utility companies are guided by monopolistic principles of pricing. Like other private business organizations, they are interested in more earnings. Classifications of buyers, price schedule revisions, and voluntary price reductions are controlled, for the most part, by the prospective earnings that can be obtained from the price alterations. Price changes generally are made only when the company managers foresee satisfactory increments in net earnings—only when the revenue increments are expected to be larger than the cost increments. But utility firms never have perfect opportunities for monopoly pricing; they do not have complete control of prices. Since price schedule changes, voluntary price reductions for some buyers, service classifications, and prices for new services are subject to commission regulation, the use of monopoly power for price discrimination is limited.* Nor do the companies take full advantage of their pricing authority. They pass over some chances for price differentiation and price schedule changes, and do not seek every possible increase in net earnings. Yet some monopolistic pricing, aimed at increases in earnings, is practiced.

Generalized Diagrams. When utility companies choose prices for their services, they do not follow exactly the generalized concept of monopolistic pricing. Yet the idea of monopoly pricing, illustrated with simplified diagrams, is a good starting point for our discussion. The seller, let us imagine, has a pure monopoly: he controls the output and selling price of a certain commodity, and no other firm has an opportunity to enter his market. Adjusting the output and price of the commodity, this seller can maximize his earnings. Maximization of the monopoly return is described in Figure 12. The demand of the buyers (the amounts of a commodity that buyers are willing to purchase at various prices) is rep-

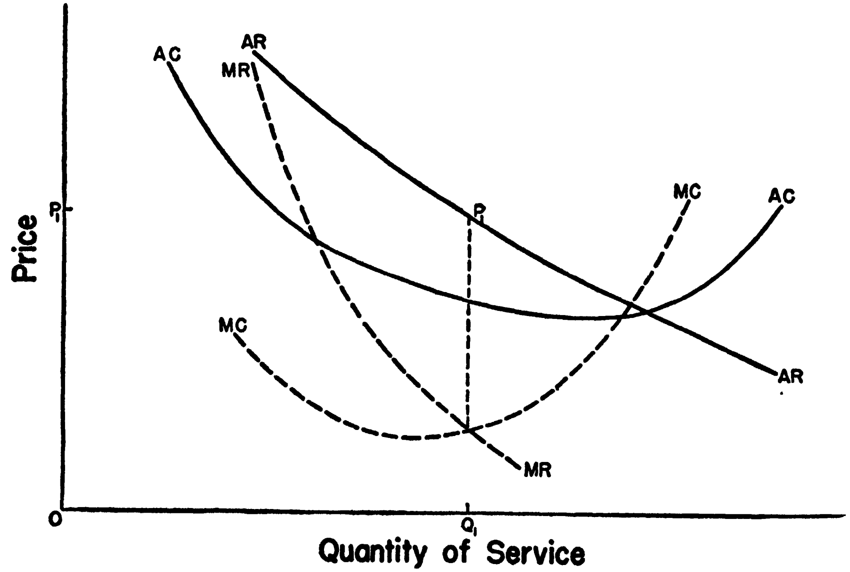

Fig. 12.

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* If commissions always exercise perfect control of earnings, utility companies are not interested in more price discrimination. Ordered to reduce some prices as soon as additional profits are obtained, they do not gain anything from price discrimination. Either the managers of the companies anticipate profits from further price differentiation, or they keep the established prices.

resented by the *AR* (average revenue) curve; *AC* is the average-cost curve; the marginal-revenue curve (*MR*), showing the increments in total revenue as the selling price decreases, is derived from the *AR* curve; and the marginal-cost curve, showing the successive additions to total cost as output increases, is derived from the *AC* curve.

To maximize his profits, the monopolist extends production to the point where the marginal revenue is equal to the marginal cost. When the price is P_1 and the output is OQ_1, the company receives the largest amount of net earnings. If a higher price than P_1 is charged and a smaller output than OQ_1 is produced, the company still obtains a monopoly return. But the return is not maximized, being smaller at a higher price than P_1, because the marginal revenue exceeds the marginal cost of production. As long as this is true, a price reduction brings in more additional revenue than the additional cost, and profits increase. As the price is lowered toward P_1 and output is expanded toward OQ_1, the monopoly return increases.* On the contrary, the company incurs an earnings reduction as output is expanded beyond OQ_1, because the cost increments (*MC*) are larger than the revenue increments (*MR*).

Figure 12 describes the general, unregulated case of monopoly pricing rather than the case of public utility pricing. When a monopolist is not subjected to public regulation, he can adjust his price and output so that the earnings are maximized. That choice is not open to public utility firms, which, because their price levels (earnings) are subject to commission regulation, cannot manipulate prices until the profit-maximizing prices are found. Their prices cannot be increased unless the current earnings are unreasonably low. But these firms voluntarily can offer price reductions to old buyers, or they can introduce new services at new low prices. These price changes can be controlled in a monopolistic manner, and can increase the company earnings. And because the commissions do not undertake frequent earnings investigations, the firms can keep these earnings increments for several years or even an indefinite time.

A public utility case for monopoly pricing is illustrated graphically in Figure 13. P_1 is the prevailing price level; it is the average price at which the company sells the OQ_1 output. As the *AR* curve indicates, the buyers are willing to pay more than an average price of P_1 for some of the OQ_1 output. But the demand above P_1 has no bearing on the present pricing policies of the firm. Receiving revenue in excess of production costs, the company scarcely can get a price increase from the commission. It is held to a P_1 price for an OQ_1 output. But the company can take account of the buyer demand below P_1. When the *AR* curve is elastic, the firm can offer a price reduction to buyers who are willing to purchase more service.* A differential price of P_2 for Q_1Q_2 output increases the profits. A marginal-revenue curve, *MR*, is derived from the *AR* curve; only the *AR* curve below P_1 is significant in this pricing situation.[2] The facts of Figure 13 show that the company can afford to offer a price reduction for the output beyond OQ_1. A new price of P_2 is determined, like other monopoly prices, by the equation of marginal cost and marginal revenue. But the whole output of the firm is not sold at the new price, P_2. Selling all its output at the new price, the company can incur a decrease rather than an increase in its earnings. Only the new output is sold at the new price. The utility firm still sells the quantity OQ_1 at the old price level of P_1, but it sells the Q_1Q_2 output at the new price of P_2.

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* The determination of the profit-maximizing price obviously depends in the elasticity of consumer demand. Because the *AR* curve in Figure 12 is slightly elastic, the company can get additional revenue from price reductions. But when the demand is inelastic, the total revenue decreases as the price is reduced. Confronted with an inelastic demand, businessmen naturally prefer price increases to price reductions.

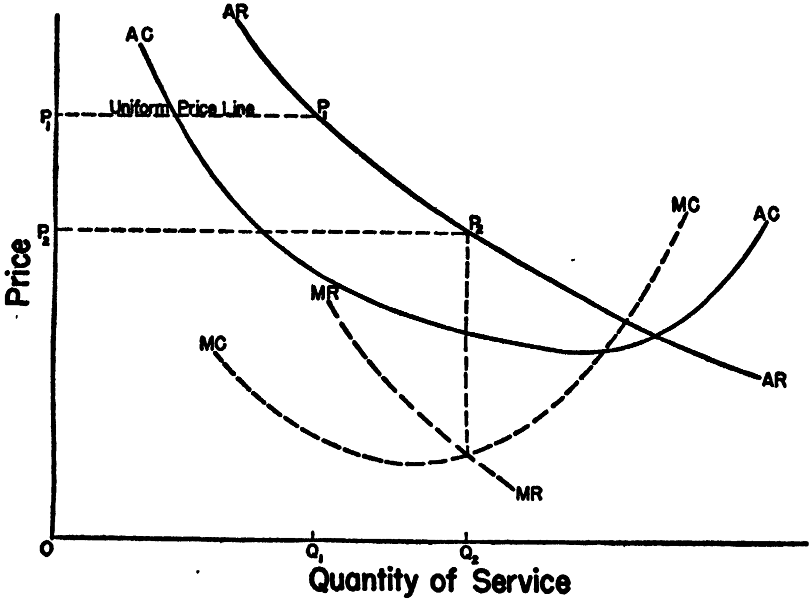

FIG. 13.

A further adjustment is needed, however, before the monopoly pricing analysis of Figure 13 fits the conditions of public utility regulation. The prevailing price level, marked by P_1 of Figure 13, is above the average-cost curve. If the average-cost curve is based on the reasonable operating, depreciation, and investor return costs of utility service, the company has excessive earnings. Commission regulation is supposed to equate the reasonable total costs of utility service to the total revenue from utility service. For this reason the price level, which is P_1 of Figure 13, should be equal or nearly equal to *AC*.

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* Price differentiation affects the shape of the demand curve. When buyers must purchase some service at P_1 before they can buy any service at P_2, they are not willing to purchase as much at P_2 as if a uniform price of P_2 is used. The demand curve shifts to the left below the initial price.

Even if the total revenue is equated to the total reasonable cost of service, the company still can obtain additional profits from price differentiation. Eliminating the excess return, the commission reduces the uniform price until it is equal to the average reasonable cost of service. But the commission does not change the demands of the consumers; some buyers are willing to make additional purchases at lower prices than the uniform price. Figure 14 illustrates a possible case in which price differentiation can be profitable despite the commission control of earnings. Before the earnings are investigated and revised, the P_1 price is located above the average-cost curve. The commission equates the uniform price, P_1, and the average reasonable cost of service; P_1 is fixed at the point where the *AR* and *AC* curves intersect. Then, to achieve price differentia-

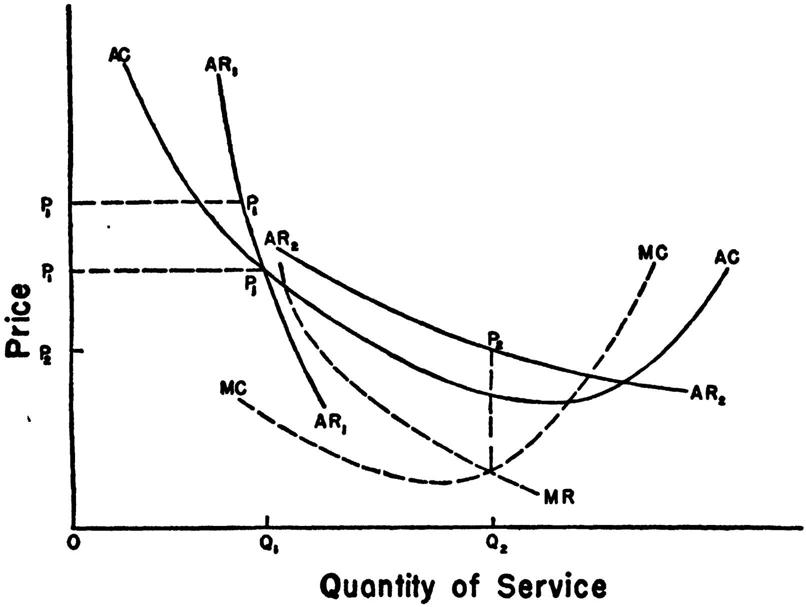

FIG. 14.

tion, the company separates the buyers' demands into two parts that are shown by the AR_1 and AR_2 curves. These demand parts can belong to separate buyer classifications (e.g., residential and industrial buyers); or demand differences within a single consumer classification can be the basis of the segregation. Under these conditions the company accepts the P_1 price for the AR_1 consumers who are not interested in much more service. But the firm offers a price discount to the buyers who are expected to make substantial additional expenditures for service. The most profitable price for additional service, P_2, is determined by the intersection of MR (derived from AR_2) and MC.

Limitations of the Diagrams. Figures 12, 13, and 14 express the idea of monopoly pricing. They describe graphically the general principle of profit maximization—the equation of marginal cost and marginal revenue. But they do not describe exactly the way in which the monopoly pricing takes place. When they see diagrams of this sort, readers often think that economists are presenting strictly factual descriptions of pricing practices. Following the matter-of-fact line of modern education, these readers do not understand that the diagrams express the general conditions and the general limits of monopoly pricing. They do not distinguish between the general principle and the actual practice of monopoly pricing.

As they choose new prices and develop a differential pattern of pricing, the managers of utility companies do not set up diagrams such as Figures 12, 13, and 14. These managers do not have smooth cost and revenue curves with which they can decide on price changes. Their cost and demand knowledge is imperfect. They even do not use the concepts of marginal cost and marginal revenue in precisely the same way that economists use them. Working with available cost and demand data, the companies make only approximate applications of the monopoly pricing principle.

The monopoly pricing of utility companies is controlled by cost and revenue increments. The increment cost, a common cost concept of utility-company managers and engineers which is described in the preceding chapter, is measured with lumps of output rather than the single output units of marginal-cost measurements. Looking ahead, the managers try to anticipate how much the total cost and total revenue will increase when price changes induce more consumption of service. They can afford to reduce or to differentiate prices when, as the output increases, the expected revenue increment exceeds the expected cost increment. And if a company desires the largest possible increment in earnings, it chooses a price change and plans for an output change where the revenue increment is farthest above the cost increment. Lacking exact measures of marginal cost and marginal revenue, the utility companies cannot choose perfect monopoly prices. Yet, as long as they are guided by cost and revenue increments, they do have a practical kind of monopoly pricing.

Cost and Demand Knowledge. The monopoly pricing of utility companies is based on expected cost and expected demand behavior. Neither the revenue increment nor the cost increment is a certainty. Consequently, when price schedules are revised, prices are voluntarily reduced, or new service classifications and new price differentials are introduced, a firm cannot be sure that a certain increment in net earnings can be obtained. The cost increment is subject to conditions of plant construction, future technical changes, and unknown changes in labor and raw material costs. Perhaps a company, relying on past experiences, can make good estimates of the plant-investment and plant-maintenance costs that will be incurred as output expands. Yet the company does not know how the future technical innovations will affect the service life of equipment, or what changes will be made in property and income taxes. And it cannot predict just how much the long-period increment in operating costs will be. The future prices of labor and raw materials, which are affected by general business conditions and labor union policies, can be higher or lower than the present prices.

The revenue increment is dependent on the demand behavior of consumers. Both the immediate and the future behavior of demand have a bearing on price management. Among the long-period conditions are the future changes in demand—the increases or decreases in demand. No one knows today just what the demand for utility services will be in ten or fifteen years. Substitute products can develop, and can attract customers away from a utility company. Or the tastes and incomes of consumers can change, giving the company larger or smaller annual increments in revenue than it originally anticipates. Facing these uncertain demand conditions, companies must guess about the best price changes or the best differential pattern of prices. Perfect application of monopoly pricing principles is impossible. Some price changes doubtless are withheld because the future revenue effects of the changes are unclear or unattractive. Indeed, the companies withhold most price changes unless they are firmly convinced that the long-period increment in revenue is expected to be larger than that in costs.

The revenue increment is affected, too, by current demand conditions. When a price change is contemplated, companies want to know how much service the buyers are willing to take at various untried prices. Yet these facts about current demand, which commonly are expressed in a demand curve, are not fully known. As Joan Robinson says, the managers of "up-to-date businesses" have only the "vaguest notion" of the demand curves for their products.[3] Managers know their sales at today's prices; and they accumulate much statistical information about previous sales. But they cannot tell you how much the buyers are willing to purchase at various prices above or below the prices that are used. They do not commonly think, indeed, in terms of demand curves. Like other businessmen, they have a simple concept of demand: the demand for a day or month is the sales of the day or month. Utility-company managers have a special term which they use to describe the demand for service: they frequently speak of the "load" of utility service. The load, a term that shows an engineering influence in public utility pricing, generally means the prevailing sales of service or, at times, the potential purchases of the existing buyers. But the notion of the load, like other business concepts of demand, apparently is not treated as a function of prices, increasing as prices decline or decreasing as prices rise.

A utility firm usually has less and less knowledge of current demand conditions as prices are farther and farther away from the existing prices.[4] Current sales at existing prices are known facts. Possible sales at untried prices are not certainties. Thus, when a company contemplates price changes, it must allow for mistaken estimates of demand conditions. These uncertainties can increase in proportion to the price changes. Such uncertainties about demand conditions are illustrated in Figure 15. P_1 is the existing level of prices, and the estimated demand curves fan out from this point of sales experience.

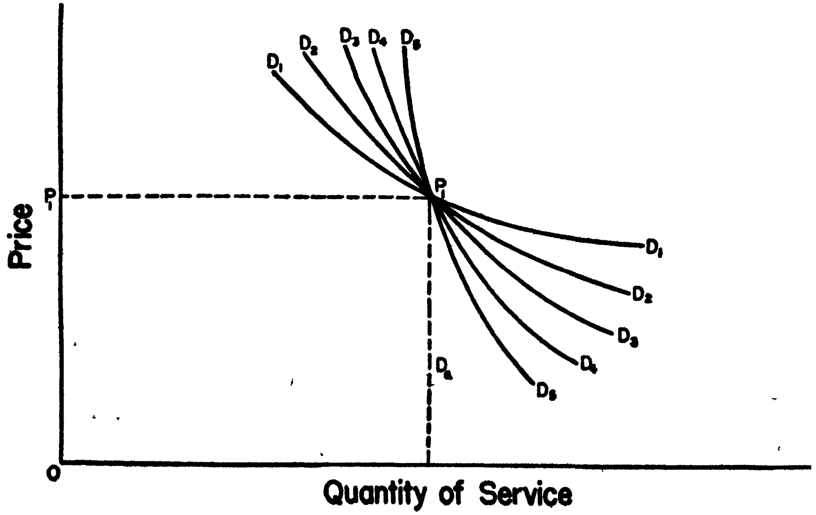

FIG. 15.

Considering only the immediate responses of buyers to price changes, a company can experience a perfectly inelastic demand for its service. The D_a curve of Figure 15, which shows no buyer response to price reductions, is a perfectly inelastic curve. Later, as the buyers respond to price reductions, the demand increases and shifts to the right. Given time to react to new prices, buyers even may increase their expenditures for utility service. The company can take its choice of demand conditions. Taking a conservative view, it can believe that the demand is inelastic. If so, no price reductions are voluntarily given to the consumers. Or the firm can believe that buyers ultimately will increase their purchases and expenditures. At any rate, the demand curves of Figure 15 show a possible range of demand estimates. Affected by these possible variations in output as prices change, the maximization of profits is more a matter of chance than a problem of skillful and conclusive calculations.

Disinterest in Profit Maximization. The managers of utility companies do not search for every possible addition to their earnings. They do not make the most of all pricing situations. These managers are not indifferent to some profit opportunities because they have superior moral principles of business. They seem to have quite as much interest in profits as the managers of nonutility companies have. But the regulation of earnings and other conditions, which are discussed later, limit the search for more profits. The prospering Bell system of telephone companies is one organization that is not anxious to get large additions to its earnings. Even when the long-lines business of the Bell system was under the ineffectual control of the Interstate Commerce Commission, AT&T apparently did not try to maximize fully the profits of the business. The hired managers of AT&T frequently said, indeed, that they did not try to maximize earnings.[5] Even in the twenties the president of AT&T, speaking before the National Association of Railroad and Utilities Commissioners, said, "The only sound policy is to continue to furnish the best possible telephone service at the lowest cost consistent with financial safety." And he added that "there is not only no incentive but it would be contrary to sound policy for the management to earn speculative and large profits. . . ."[6]

The wage and employment policies of utility industries do not reveal that the companies are anxiously searching for a few more dollars' worth of earnings. Trying to maximize earnings, a company pays no higher wages and provides no better working conditions than union policies and market conditions necessitate. This is not the labor policy of many utility companies. Telephone, gas, and electric firms often pay liberal wages and provide comfortable, pleasant, and safe working conditions. Even when the employee is still in "training," high "starting" wages are common. Nor do utility companies cut wage rates sharply during depressions. The firms have pecuniary reasons for a generous labor policy: they want to build up good public relations. Satisfied employees, they know, go among the citizenry and build up the public position of the companies. These employees can mollify irate consumers, reduce the chance of regulatory investigations, and help to maintain the financial status of the systems. This does not mean, however, that the companies do not dismiss employees. But as long as they employ a person, utility companies want him to be satisfied and faithful.

The first financial objective of many utility companies is maintenance of interest and dividend payments. Their future credit standing is more important than nominal increments in earnings. The Bell system, for example, aims to maintain a high annual dividend for each share of AT&T stock.[7] After the financial welfare of a company seems to be assured, the managers are willing to take some chances on price changes—on an uncertain cost and demand behavior. Even so, they do not always seek the maximum possible enlargement of earnings. After they have enough earnings to meet financial obligations, they are satisfied with ordinary, respectable additions to the total earnings. Prospering companies do not always want to be troubled with new services, price changes, and uncertain cost and demand conditions, just as a prospering physician is not always interested in more patients when the golfing weather is good. As Hicks says, "The best of all monopoly profits is a quiet life."[8]

Reasons for the Disinterest. Commission control of earnings does not encourage the maximization of profits. Utility companies know, of course, that their earnings are not investigated and are not altered every year. But when a firm follows a monopolistic pattern of pricing and obtains an earnings increment, it can lose the increment in the next investigation. Knowing this, a utility firm is not induced to seek all possible increases in its earnings. If a company takes chances on demand and cost conditions and luckily gets a considerable increment in earnings, the commission can wipe out the whole increment. Unless a company can keep the additional earnings for a considerable time, it gets only small compensation for the pricing troubles and chance taking. Perhaps, too, the firm fears that the old excessive earnings as well as new additions to earnings will be eliminated. Trying to get every possible earnings increment, it can attract regulatory action and incur a large earnings reduction. On the other hand, if the company tries to maintain the existing and moderately excessive earnings, it may escape regulation for a long time.

A consumer-relations policy also moderates the acquisitiveness of utility companies. They rarely have a "public-be-damned" attitude; they act instead as though they love the consumers. Today the managers of utility companies put much emphasis on their buyer relations and "public education." Seeking to maintain pleasant and profitable buyer relations, a company must proceed cautiously with price differentiation and earnings enlargements. Showing clearly an acquisitive pricing policy, a company creates buyer pressure for an earnings investigation; most buyers, who think utility companies make a "lot of money," are easily stimulated to seek price reductions. A utility firm does not want to be called a profit-hungry monopolist. Even for those who have one, the term "monopoly" is opprobrious.

The nature of public utility management is a further explanation of the temperate earnings policy. After holding companies developed or after the ownership of voting shares of stock became diffused, the managers of the firms commonly were hired managers. The managers, furthermore, often are middle-aged or old men. By the time a man rises to a high executive position, he is likely to be fifty or more years old. He covets high managerial authority for many years. When he gets the authority and has only a few years to enjoy it, he is not inclined to take many chances. He desires a comfortable and secure managerial life. If the directors and stockholders want regular dividend payments, he tries to maintain the dividend payments; he does what the stockholders expect of him. Such a manager does not take long chances unless they are approved by the company directors. He, too, is more interested in the preservation than in the improvement of a successful company's earnings; he, too, likes a quiet life.

A corporate bureaucracy limits the expansion of earnings. Corporations, like governments, become organized into departmental hierarchies where the managerial functions are carefully delegated.[9] Large utility companies are not organized differently from other corporations; they, too, have the main characteristics of corporate bureaucracies. Controlled by hired managers who work for widely scattered stockholders, AT&T is a good example of a bureaucratic organization among the utility companies.[10] To safeguard his salary and business status, the hired manager of a utility firm wishes to retain his authority; traditions are embedded in the corporate organization; and rigid rules are made and rule books are assembled so that the functions of different managers and different departments can be defined and controlled. These rules and traditions of a corporate organization extend, of course, to pricing. Price changes do not go into effect until many persons examine them, and until a prescribed managerial procedure is followed. When a problem of new market development or further price differentiation is presented, the business organization considers not only the profit objective, but also the effect of the changes on established managerial functions and the corporate hierarchy. A large and cumbersome organization takes a long time to think and to act.

ENTRANCE INTO NEW AREAS OF SERVICE

Buyer classifications and price differentials developed gradually. When state regulation started before the First World War, electricity was sold primarily to lighting customers. Although some enterprising managers, such as Samuel Insull, were early promoters of the industrial market for electricity, the greatest growth of industrial sales occurred during the twenties. When a company manager sought more sales and more earnings in the industrial market, he chose the industrial rates. Commission approval of these rates usually was a formality. And the managers of electric companies often had control of new service prices as rural electrification, electric cooking, domestic water heating, and other new kinds of electric service were developed.

In other utility industries the same managerial authority was exercised over the new service prices. Space-heating use of gas was an example. The prices for this use of gas, which had to be low enough to attract consumers away from the use of coal or fuel oil, were determined usually by the managers and owners of gas companies. Likewise, when the gas companies sought enlargements of their industrial sales, their managers and engineers, instead of the commissions, determined the price changes. And managerial control of price differentiation was predominant in the telephone industry. When the Interstate Commerce Commission had control of interstate telephone rates before 1934, the pricing of long-lines service was left to the Bell system. The whole structure of long-distance telephone rates was worked out by AT&T. In local telephone service, too, the Bell companies usually did more than the commissions to shape the price structures.

Conditions of New Service Pricing. When a company considers new service prices and an output expansion, it looks at the anticipated relation between the revenue increment and the cost increment.* Guided by the monopoly pricing principle, it selects prices so that the expected revenue increment is larger than the anticipated cost increment. If new investment costs are incurred, the expected increment in revenue must be large enough to cover the depreciation cost on the capital goods, and to give a return on the investment that is at least as high as the increment in interest and dividend payments. Utility firms commonly expect earnings increments from a new service. At any rate, they usually do not want to break even on new ventures, whether or not the ventures require new investments in utility plant.

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* Other economic characteristics of output expansion are discussed in Chap. 21.

If a firm enters a completely new market, it usually has only meager knowledge of demand conditions. After utility firms in some regions or localities acquire experience with a new kind of service, other firms can obtain information from them about the demand for the service. Yet, even if the services and markets are similar, the demand experience of one company is not certain to be that of another.[11] Between cities or regions there can be differences in the income of buyers,[12] accessibility of alternative services, and the consumer responses to advertising. The immediate demand for a new service cannot be measured exactly; it must be estimated. And a company not only must guess about the immediate demand for a new service, but also must estimate the future demand changes.

Confronting unknown demand conditions, a utility company is bound to be cautious. Some companies wait until a fair number of buyers request the new service. Before 1935 many electric firms, for example, waited until farmers expressed a demand for rural electric service before the rural lines were constructed. In other instances companies wait until the more venturesome systems have experiences with a new kind of demand, until the earnings of the aggressive managers give the cautious ones more assurance of additional profits. Furthermore, some of them, having enough earnings for their financial needs, can afford to wait for more knowledge of demand conditions. Some firms in the electric, gas, telephone, and water industries have secure monopoly positions; they can afford to respond slowly to new opportunities for output expansion and possible earnings increases. They are successful enterprises that do not have to worry about "enough" earnings. But when other companies suffer decreases in their earnings, they often are anxious to develop new markets. Faced with receiverships unless their earnings increase, they cannot lose much in a new-market venture.

When a company has a large amount of unused plant, it may not hesitate to strike out on new market ventures. Having unused productive capacity, it does not risk any new investments in the durable plant. Utility companies commonly build enough plant so that the peak demands of all or nearly all buyers can be satisfied. Except for the day-by-day storage of gas or reservoir storage of water, utility companies must produce service at the times when the buyers demand it. Consequently they have unused plant capacity during some seasons of the year and certain times of the day. When the off-peak capacity of a plant is used, only small cost increments are incurred. If buyers can be induced to consume service during the off-peak times, a company can afford a low rate for service. The firm does not take significant risks with this kind of market development. If the demand for off-peak service increases and necessitates further investments in plant capacity, the company can request a price increase. Or it can withdraw the service. The holding-out rule, which obligates a firm to serve everyone who wants service, is less applicable to a by-product business than to a regular business.

Some utility companies have unused plant capacity during all hours of the day and all seasons of the year. Miscalculating the increases in demand, these companies have too much plant capacity for the present business. They have an excessive plant capacity. Such firms can better afford to take the chances of new-market developments than the companies that must make new plant investments. Such companies, possessing plants, incur increments in operating expenses alone. Having an excessive plant capacity, a company can enter the new markets and retrieve some of the unnecessary plant investments. The commission may classify the unused plant as "unused and unuseful," eliminating it from the rate base and denying a return on it. Even if the commission allows a return on the whole property, the company may have so much unused plant that no prices for present services provide a reasonable return. In these cases the firm can increase its earnings whenever the increment in out-of-pocket costs is less than the increment in new-service revenue. Given such a situation, it can afford to experiment in the new markets.

Commission control of earnings and prices is a further limitation.[13] Regulatory action does not restrict the market experiments of companies, such as many street railways, that already receive less than reasonable returns. But it does limit the service innovations of prospering firms. A company does not offer a new kind of service unless at least a modest earnings increment is expected. But commissions are supposed to turn excessive earnings into rate reductions for consumers. Consequently the company not only must estimate the consumer demand and guess at the best choice of prices, but also it must predict how soon the expected increment in its earnings is likely to be wiped out by regulatory action. If it anticipates an earnings investigation in the next year or two, it may not try to develop the new market. If the investigation is expected in five years or at some indefinite future time or if the firm believes that legal barriers (e.g., consideration of reproduction-cost valuations of property before the Hope Natural gas case was decided in 1944) can be set up against future regulatory orders, it feels more free to exploit a new service. Irregularity of regulation, allowing companies to keep excessive earnings for a long time, is not a complete loss to consumers; at least they are more likely to get some market expansion.

RATE REDUCTIONS FOR OLD BUYERS

Commissions have effected many price reductions, but they have not made all of them. Utility companies voluntarily have given many price reductions to the old buyers of service. Although a statistical summary of voluntary price reductions never has been compiled, these were fairly common before 1930. Up to that time the companies probably offered more rate reductions to buyers than the commissions made by regulatory action. And even if commission control is more effective today than it once was, the companies still make some voluntary price reductions.

Reasons for Voluntary Reductions. Some of these rate reductions are associated with consumer-relation policies. The managers of some utility companies, watching the work of the commissions and the changes in their own earnings, may try to anticipate the time when the commissions will undertake investigations. Anticipating an earnings investigation in the near future, a firm can offer an immediate rate reduction to the buyers. It concedes an earnings loss now, and receives credit for the price reduction. But it does not need to give the buyers all the excess earnings; it can reduce earnings just enough to avoid a formal regulatory investigation.

A voluntary price reduction sometimes is offered to buyers because cost economies can be realized with an output expansion. A utility company naturally attempts to restrict these price reductions to the buyers who have an elastic demand; it wishes to reduce the prices of the buyers who are willing to increase their total expenditures on utility service. And it may wish to keep the old price or prices for the existing purchases, making the price reductions applicable to new purchases alone. A condition of unused plant capacity affords one opportunity for low-cost production of more output. A company may be operated under a condition where the average-cost curve still is sloping downward; in this case a price reduction, such as the one illustrated in Figure 14, can be advantageous. But rate reductions do not increase the earnings of a company just because the average-cost curve is sloping downward. An earnings increase depends on the relationship of marginal cost and marginal revenue rather than the downward slope of the average-cost curve. If a firm sells service at low prices to the regular customers and still has much unused plant capacity, it may be forced to look to new customers for more earnings. It may be forced to look to customers who are not yet sated with utility service, who respond to low, differentiated prices with enough expenditures so that the earnings increase.

The cost economies of technical innovations are other reasons for voluntary price reductions. To be used economically, some technological changes require large scales of operation. When these economies of output expansion are large, companies can afford large price reductions. This is true when buyers are induced to consume much more service and to multiply their expenditures. Looking at the history of utility price structures, we can see that technical changes explain many voluntary price changes. In the electric industry the generation and transmission innovations often were followed by large price reductions and a rapid expansion of electricity consumption. And during the thirties when innovations were made in natural gas transmission, the companies voluntarily offered large price reductions to industrial and space-heating customers.

The managers can use price reductions to stop the entrance of rival firms. If a community is considering the installation of a municipal electric plant, the private company can offer its buyers a rate reduction, and hope to change public opinion on the municipal-ownership issue. When municipal ownership threatens the existence of a private firm, the price reduction ordinarily goes to the domestic buyers of electricity. In this case the private company disregards the inelastic demand of these buyers, and looks for more votes rather than more revenue and earnings. Private companies infrequently face the threat of competition from other private companies. But when they do confront such competition, the companies can give price reductions and try to hold their customers.

A company offers price reductions, too, so that it can retain customers in the face of demand decreases. In some cities the street railway and bus companies voluntarily reduced their prices for this reason. When the use of private automobiles reduced the demand for urban transportation service, the railway and bus systems could choose a price reduction that might hold some customers, or resign themselves to idle or partially used equipment. Perhaps they could not hope to get reasonable earnings, but they still could try to minimize their deficits. They could afford to take a short view of the pricing situation; being willing to reduce prices whenever an addition to company earnings was in sight, these transportation companies could afford to count simply the out-of-pocket (short-period) increments in expenditures. In time they were compelled to choose between either complete abandonment or contraction of operations, for they could not sell service at the low, deficit-minimizing prices forever. Meanwhile, the price reductions gave them opportunities to recover some of the plant investments.

Risks of Price Reductions. The downward bias of utility prices is a limitation of voluntary price reductions. Regulators usually approve price reductions, but they resist price increases. A commission seldom rejects a price reduction. But when a company wants to restore the former and more profitable prices, the commission may not grant the price change until a general earnings investigation is made. Buyer reactions to price increases are responsible, too, for the downward bias. After buyers are oriented to price reductions, they are opposed to restoration of the old prices. Anticipating the continuation of the low prices, buyers change their purchasing habits. Some buyers, for instance, purchase expensive appliances so that they can utilize more utility service at the lower prices. Seeing the effects of price increases on their own consumption habits, the consumers are not interested in a company's loss of earnings. Thus the company disturbs its own consumer-relations policy when, as a result of a poor-earnings experience with a voluntary price reduction, it wants to restore the old prices. Since there is a downward bias in earnings and price control, a successful company, which plans to continue operations indefinitely, must take a long view of voluntary price reductions for old buyers. It must be quite certain that the reductions are permanent, unless a future revision of earnings regulation (such as the suggestion for continuous control that is outlined in Chapter 18) opens the way for experimental pricing.

The unknown behavior of consumer demand restricts voluntary price reductions. The demand must seem to be elastic before a utility company, seeking an increase in its earnings, offers some buyers a rate reduction. For many old-customer uses of service the sales may not increase enough with price reductions for the firm to get an increment in revenue. Electricity already is used extensively for lighting in homes, shops, and factories. If the price for lighting use of electricity is reduced, most electric companies incur a decrease instead of an increase in total revenue. The lighting market, figured according to established lighting methods and habits, is so saturated at existing prices that the demand is inelastic at lower prices. Similarly, a price reduction for the household-cooking use of gas probably results in a decrement rather than an increment in revenue; not many new buyers can be obtained at a lower price, and the modern housewife does not do more cooking just because the price of gas is lowered. Seeing these conditions, the company managers believe that there is an inelastic demand for most established uses of their services. They believe that the demand for utility services is inelastic until they see fairly conclusive evidence of an elastic demand.

Even if price reductions are granted for the established and regular services, they are not always accompanied by total revenue reductions. Demand can be elastic for some old uses of service. Enough new buyers and increases in old buyers' consumption can be obtained so that a company obtains additional revenue from a price reduction. Increments in total revenue sometimes may depend, however, on the amount of the price reduction. When this is small, the total revenue may not increase. But a large reduction can attract the attention of existing and potential buyers. When the fare of a bus company, for instance, is reduced from 10 to 9 or 8 cents a ride, the firm may not get an increase in revenue; but when the fare is reduced from 10 to 5 cents, there may be a better chance to attract new riders in some localities and to get a revenue increment. Yet the important fact is the uncertain buyer response to any price reduction. This uncertainty is a real limitation of voluntary price reductions. And even when an increase in revenue is expected at a lower price, the company still may hesitate to reduce the prices; before this is done, the firm wishes some assurance that the increment in revenue is sufficient to cover the increment in expenditures.

Confronted with a downward bias of prices and uncertain knowledge of demand elasticity, a utility company can proceed cautiously with price reductions. It can offer buyers a moderate price reduction, and advertise the opportunity for new and cheaper uses of utility service. If the initial reduction brings an increase in the firm's earnings, another moderate reduction can be tried. In this manner the company experimentally approaches the economical limits of price reductions, studying the speed and revenue response of buyers to successive price reductions as well as the cost increments of output changes. But the successful company, which has enough earnings for a comfortable financial existence, still may not be willing to experiment with the uncertainties of demand elasticity.[14] Furthermore, an expanding utility firm sometimes is not interested in studies of demand elasticity. It can get earnings increments in another way: it waits for demand increases and utilizes technical innovations.

Special Promotional Rates. Utility companies can arrange the price reductions so that they are protected against losses of total revenue—even against losses of earnings. They retain the established prices for the existing sales, and reduce prices only for increments in buyer consumption. This price differentiation between old and new purchases evades the uncertainty of demand elasticity. Any sales at the new and lower price bring the company an increase in total revenue. Since this kind of price differentiation induces buyers to purchase more service at lower prices, it is commonly called "promotional pricing." As we shall see in later chapters,* utility companies have many kinds of promotional pricing. A block-price schedule, for instance, is a common kind of promotional price schedule: one price is charged for several units of service, another and lower price is charged for several additional units, and so on. Starting with uniform prices for all service units, most utility firms offered to sell additional service at lower prices. This price differentiation worked; consumers bought more service and spent more money.

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* Promotional forms of price schedules are discussed in Chaps. 27 and 28.

Some special forms of promotional price reductions were introduced during the depressed thirties. Experiencing losses of revenue in some markets and facing public pressure for price reductions in all markets, electric and gas companies devised some ingenious ways to reduce prices and to please the consumers. Some of the depression-time changes were called "bargain" rates,[15] though the companies usually protected their existing revenues. One bargain rate was simple: the residential and commercial buyers were offered unlimited service for a few months and were charged only the previous month's bill. Buyers could consume, for instance, as much service as they wanted during May and June, but the bill for May or June was no higher than the bill for April. A second type of price change also gave buyers some "free" service. A domestic buyer of one electric company, for instance, received 25 "free" kilowatt-hours for each purchased increase (each purchased increase above his consumption during the corresponding month of the preceding year) of 5 kilowatt-hours. This company did not change its prices of service, but it did restrict each customer to 25 free kilowatt-hours each month.[16] With another bargain rate, which was expected to increase appliance sales as well as service consumption, some of the additional buyer expenditures were credited against the purchase prices of appliances. When a consumer bought an electric stove, he did not pay the full retail price for it. Instead, he was given a credit on the stove price that was half the difference between his current electric bills and his average electric bill during the year before the stove was acquired.

The Objective Rate. During the thirties the "objective" rate was the most distinctive managerial innovation in electricity and gas pricing. It appeared first in the Southern states. Challenged by the entrance of the Tennessee Valley Authority and the low prices of TVA service, the operating companies of the Commonwealth & Southern system in Alabama, Georgia, and Tennessee began to use the objective rate in 1934.[17] After these companies had good luck with the pricing procedure, other electric and gas firms adopted it and tried to stimulate increases in service consumption. The objective rate was used primarily for residential electric and gas service.

Under the objective-rate plan there were two price schedules: the old or immediate schedule, and the objective schedule. Using the old (immediate) price schedule to determine how much was spent for service during the twelve months before the objective-rate plan was introduced, a company computed monthly "base" bills for each customer.* But when the buyers actually purchased service, their bills also were figured with the lower prices of the objective schedule. As long as the buyer's consumption did not decrease, he paid either the base bill or the objective-rate bill, whichever was higher. Under the common plan for the objective rate—the plan introduced by the Commonwealth & Southern companies—the buyer received some "free" service as his consumption increased. Between the base bill, figured according to the old or immediate schedule of prices, and the same bill with the objective schedule, there was a difference in kilowatt-hours. For the base bill the buyer could obtain more service with the objective schedule.

Following the original plan of objective pricing, most companies did not charge anything for the free ("cross-over") service. Other companies had a different policy: they gave buyers a 50 per cent discount on the so-called free or cross-over units of service, or they charged a nominal price for the units.[19] In the original form—the Commonwealth & Southern form—the plan had a specific time limit which commonly was three years. After the time limit expired, the old or immediate schedule was abandoned; and the objective schedule was used to compute all customer bills. Several firms specified that the objective schedule was the only schedule when a certain percentage of the customers bought service under the objective rate, or when the consumers bought more than certain minimum amounts of service. But some companies did not fix definite times when the objective schedule would be used to compute all consumer bills. These firms wanted to be sure that their earnings were protected.

The objective-rate plan, an ingenious and complicated pricing technique, often induced more consumption of utility service. Some buyers, who consumed more service, received price reductions immediately. When old prices were abandoned and the objective-rate schedule was universally used, all consumers paid lower prices for service. The companies utilized idle plant capacity and received more earnings. And the objective-rate plan avoided possible earnings losses from immediate, general rate reductions. New rates did not go into effect until most buyers were spending more money for service; it was a safe way to reduce utility prices.

The objective-rate plan was a discriminatory form of pricing. Differentiating between buyers, it gave free service and price discounts to the buyers who consumed more service. Some buyers had enough income to purchase expensive appliances, and could take advantage of the objective-rate schedule; others, who could not afford more appliances, were confined to the old schedule until the two-schedule system of pricing expired. There was more discrimination when a minimum amount of service consumption was required before the objective schedule became effective—when the small buyers did not get so much free or low-priced service as the large consumers did. The base year, moreover, was not always a "normal" consumption period for all buyers. If a buyer happened to have uncommonly high bills during the base year and if his consumption habits returned in later years to a lower and customary level, he did not get any free service or price discounts. Finally, it was a complex form of promotional pricing that the buyers did not always understand. Yet, even though the objective-rate plan had obvious social and administrative limitations, commissions generally approved it.[20]

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* Disregarding differences in consumption habits, most companies computed base bills for all buyers. But other companies fixed a minimum base consumption, commonly a minimum of 20 or 30 kilowatt-hours for electric companies.[18] When buyers consumed less than the minimum, they did not receive objective-rate benefits until their consumption expanded beyond the minimum.

A CONTINUING PRIVATE MANAGEMENT OF PRICES

Private pricing authority did not pass out of existence or become meaningless after state regulation spread over the nation. Nor did the expansion of federal control or the tightening of state regulation after 1930 eliminate it. Statutory power over prices is vested in the commissions, but the utility companies often continue to exercise much of their monopoly price fixing. They do not have, to be sure, the price-fixing freedom of unregulated monopolists. Lacking extensive knowledge of demand and cost conditions or fearing earnings investigations if excess profits are built up, the managers proceed cautiously with their price experiments; knowing the resistance of old buyers and regulators to price increases, they do not try to curtail the existing outputs. Under these conditions the manipulations are confined largely to new sales and price reductions. One common source of additional profits is the development of a new market; a new service classification is created, and prices are fixed so that customers are attracted away from other services. Another choice is lower prices for old buyers—either reductions of the established price schedules, or special price changes such as the many "bargain" and "objective" rates of the thirties. The new prices usually are private choices. Indeed, the general shape of price differentiation, which is examined in the next three chapters, is more a historical product of company management than of public regulation.

Chapter 26

Pricing for Buyer Classes

PRICE DIFFERENTIATION, a distinctive characteristic of public utility pricing, takes two general forms. Practicing one kind, the companies classify the consumers; the use of service is the common basis for buyer classifications, and different prices are fixed for each of the classes. This form of price differentiation can be called "class pricing." The railroads do class pricing on a large scale, differentiating between many commodities that they transport. Other utility companies do not have the same opportunities to use differentiation of utility services; yet some of them, particularly the electric and gas companies, have several service classifications. The other form, expressed in the price schedules that are chosen by utility companies, differentiates the prices of the buyers who compose a single class of consumers. Since the average price of service decreases as the individual consumer increases his purchases, this kind of price differentiation can be called "quantity-discount pricing."

There are two economic bases for price differentiation. One is the difference in service costs. A company sometimes incurs more costs to serve one class of buyers than another class; and the average cost of service sometimes is lower for the large-quantity purchaser than for the small-quantity buyer. Some of the price differentiation between classes of utility consumers can be accounted for, to be sure, by differences in service costs, though the cost measurements are difficult or impossible under joint production conditions. Another economic basis for price differentiation is the difference in the buyers' demands. Those with an inelastic demand are charged the highest prices; others, who have a low price elasticity of demand, are charged higher prices than those with the most elastic demand. When price differentials are based on differences in demand behavior, a condition of discriminatory pricing exists. Discrimination is evident in nearly all utility price structures. And regulators do not try to eliminate it. Commissions have authority to restrict or even to eliminate price discrimination; yet the companies are quite free to develop such a pattern of pricing. Either the commissions do not want to prevent price discrimination, or they never understand its economic nature. Perhaps even the managers and rate engineers of utility companies also fail to realize how much discriminatory pricing is used for their services.[1]

COMMON BUYER CLASSES

When the electric industry started to develop, most of the electricity was sold for lighting uses. Electric companies usually had only one class of buyers. Then, as the industry matured and new uses for service developed, the managers of companies created a number of buyer classes. Residential, commercial, and industrial service became the common market subdivisions. And a number of special buyer classifications were created within these subdivisions. When improvements were made in the electric stove, for instance, and the electric industry wanted to share the cooking market with the coal and gas industries, some electric companies often set up a separate, low-price classification for buyers who had electric stoves. Occasionally a special price was fixed, too, for domestic water heating. Separate classifications were established for large and small power consumers, advertising signs, railway electrification, and service at the company's primary (untransformed) voltage. Industrial sales and prices even were differentiated according to separate kinds of manufacturing such as brickmaking, electrometallurgical, or electrochemical uses.

Some gas companies, even in the large cities, still have a single service classification or only a few classifications of buyers. Most gas companies differentiate, however, between residential and industrial purchasers. Residential consumers usually buy their gas for cooking, refrigeration, and water heating at a single schedule of prices. But a different schedule may be used for house-heating sales of gas. Like the electric firms, the gas companies frequently classify industrial buyers according to the uses of gas. Separate price schedules are fixed for general industrial heating, special kinds of industrial heating, large-scale refrigeration, and air conditioning.

There are several classifications of telephone service. In most cities the residential consumers of local service can have single-line service; or they can share a line with one or three buyers. Coin-box service of a public or semipublic nature is another service classification. When telephone service is classified, business firms are separated from residential buyers. And telephone companies provide private branch exchanges for large business firms and hotels. In toll telephone service the short and intrastate calls sometimes are differentiated from the interstate and long-line calls.* Other prices are fixed, usually by special contracts, for wires

* Some of these differentiations of toll service are not approved by commissions.[2] Unless there are differences in the costs of the services, state commissions do not approve

that are leased for such purposes as teletypewriting and radio broadcasting circuits.

Neither water nor urban transportation companies have so many customer classes as other utility firms. Water service, which commonly is performed by municipalities, is sold frequently at a single price schedule for all uses. In some cities, however, the water systems differentiate between residential and industrial service; and when the water systems are privately owned, they usually have separate service classifications for fire protection and other municipal uses of water. Although all urban transportation riders naturally do not have the same demand for service, bus and street railway companies cannot differentiate the uses and prices of service so easily as is possible for other utility companies. School children commonly ride for a reduced fare, and the weekly pass or some similar device is used occasionally to differentiate the steady rider from the irregular rider. Yet most bus and streetcar riders pay a uniform price regardless of the time, the frequency, or the length of their rides.

THE COST RATIONALE OF PRICE DIFFERENTIATION

Class pricing often is discriminatory pricing because it is based on the demand differences between the buyer classes. The general characteristics, evolution, and social desirability of discriminatory class pricing are the main parts of this chapter. But before these topics are dealt with and before the evidence of discriminatory utility rates is assembled, let us consider the cost arguments with which the companies try to prove their use of nondiscriminatory prices. Although a pricing practice is not socially bad just because it is discriminatory, utility companies do not like the charge that they discriminate against some customers. Some of them, particularly gas and electric companies, try to prove that price differentiation is based on cost differences. Two kinds of cost analysis commonly are used to explain the price differentials. One is based on the "increment" costs, not the average or total costs of the differentiated services. The other kind involves an allocation of the joint and overhead costs to the several customer classifications. Undaunted by the arbitrary nature of joint cost allocations, the rate engineers and managers of utility companies compute the average or total costs of each kind of service.

The Incidental-output Argument. The lesser of the two cost arguments concerns the economical utilization of plants. Utility companies ordinarily have some unused plant capacity, because buyers do not pur-

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higher rates for intrastate calls than for interstate calls for the same distance. But differences in operating conditions and costs of service, particularly the investment costs of toll circuits and density of toll calls, often justify higher intrastate toll rates.[3]

chase service steadily throughout a day, week, year, or business cycle and because utility services are nonstorable except for day-to-day storage of gas and water. A company's load curve, an engineering rather than economic description of the time shape of demand, contains peaks and valleys when it is drawn for such time periods as a day, a year, or a business cycle. The load factor of a utility firm—the ratio of the average output to the peak output for a given time period—is never as high as 100 per cent for an ordinary utility system, and often is below 50 per cent. Under these conditions the companies often have much off-peak capacity for service production.

If the unused capacity of the firm can be utilized and if the load factor can be improved, the utility company can afford to differentiate its prices. Off-peak sales, which do not necessitate further investments in plants, can be made at low prices. As long as the increments in revenue exceed the increments in total cost for an expanding, off-peak output, the class prices for this sort of output are justified. These increases in earnings can be used to reduce the prices of the on-peak, regular buyers. Using these off-peak earnings to pay some costs of on-peak service, companies have less fixed costs, such as the depreciation costs and the investor returns, that are charged to the regular buyers. Off-peak business is a by-product of the general output, and the off-peak earnings reduce the costs of regular output.

Differentiation between off-peak and on-peak service does not cover all the class pricing of utility firms. Yet the intrepid managers and the rate engineers use the off-peak argument everywhere, and try to justify all kinds of price differentiation. Most companies have unused plant capacity even at the times of the peak loads. The utilization factor of plants—another technical term that is defined as the ratio of the peak load to the potential output capacity—often is no higher than 70 or 80 per cent under ordinary demand conditions. This means that companies frequently have a reserve service capacity that is about 20 or 30 per cent of the total plant capacity. Adapting the off-peak argument to any condition of unused plant capacity, a firm creates a new classification of buyers and offers them lower prices than the other buyers pay.[4] This sort of price differentiation provides additional earnings if the additional revenue from the new consumers exceeds the cost increment. Treating any additional output as an incidental part of total output,* the companies say that the earnings from a new service classification are available for general price reductions. Although the company managers do not want to give up the additional earnings, they still say that the earnings can be used to pay some of the fixed costs of service.

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* This application of the increment cost method disregards the function of the reserve plant capacity. Required to serve all who come, the company is expected to hold some plant capacity in reserve for unexpected demand increases. This reserve capacity is not really unused plant capacity; not at least in the same sense that all idle plant capacity is. Being a planned reserve capacity, it is a "necessary" part of the capacity of the company for service production.

Accepting the managerial reasoning, state commissions usually approve the by-product or incidental-output argument for new class prices. When gas companies, for instance, have much unused plant capacity, regulators approve low-priced sales of interruptible gas service. Buying interruptible gas service, an industrial consumer takes the risk of a sudden withdrawal of service—sometimes on a 24-hour notice.[5] But such a buyer gets low-priced service as long as the plant is not needed for regular service. Some commissions go further, and make no clear distinction between regular and incidental business. They are satisfied with the general argument that the earnings increments from new buyer classifications reduce the costs which other buyers are expected to cover. The Wisconsin Commission, for instance, says that "competitive utility rates . . . should not be any lower than necessary to obtain the business, . . . and the rates should be sufficiently higher than . . . [the] added costs to pay something towards the overhead costs which otherwise would have to be borne in total by the other customers."[6]

This cost argument for price differentiation is valid only as long as the company continues to have unused plant capacity. Insofar as off-peak buyers are strictly confined to off-peak uses of service, the price differentiation between them and regular buyers is based on a recognizable difference in costs. The unused capacity may be available, of course, for a long period of time. But the same kind of cost conditions do not persist for the incidental, on-peak business. Demand for the incidental service can increase until additional plant capacity must be built to serve the new classes of buyers. If this happens, the incidental-service classification expands until it is one of the regular buyer classifications. Industrial sales of electricity, for instance, went through this transformation. Treated as incidental business and priced accordingly in their infancy, the industrial sales of electricity eventually were larger than residential sales.

After a service classification grows large and becomes a regular kind of business, the price differentiation is no longer well explained by the short-period increments in service costs. After the unused plant capacity disappears and new plant must be constructed to serve a growing buyer class, the short-period increments in the total costs do not prove that the price differentiation is not discriminatory. Today's prices for industrial electric service cannot be explained by the increment costs that were incurred before the First World War. These ceased to be a cost basis for price differentiation after the industrial sales of electricity became an important business. If companies want a cost rationale for price differentiation between regular consumer classes, they must deal with the joint costs of service. When a condition of joint production is recognized, the costs of any buyer classification cannot be measured as though the other classes of business already exist. If each class of business is treated as a separate increment in total company output, some of the production costs (the joint costs) are not assigned to any kind of output.[7]

Joint Cost Allocations. The managers and rate experts of electric and gas companies try to measure the average or total costs of each regular classification of service. They make these cost calculations for two reasons. Trying to safeguard their earnings or searching for more earnings, they sometimes want an average-cost measure of the limits of price differentiation. Confronted with consumer complaints against price discrimination, they also try to prove that the price differentials are no larger than the average-cost differentials for the several services. The main problem of these cost determinations is, of course, the allocation of the joint overhead costs. Several methods of joint cost allocation are proposed.[8] Some are simple; others are complex and confusing. Simple allocations are based on sales; complex allocations are based on load-factor and diversity-factor differences between the buyer classes.[9]

The companies commonly use simple methods of joint cost allocation. Originally the cost allocations were made (or argued) according to the "peak-responsibility" method, the peak consumption of service being the important factor. Using the peak-responsibility method, companies divided joint costs according to the consumption of each buyer group during the peak period. If lighting sales made up the bulk of the electricity sales during the peak period, then the lighting class of buyers was assessed most of the joint costs. This solution for price differentiation obviously depended on only one peak period of sales, and on a stable distribution of sales between buyer classes. When the industrial sales increased until the industrial buyers consumed more service than the domestic buyers, the companies were compelled to abandon this cost explanation of price differentiation. As industrial buyers became prominent consumers of electricity and gas, they created their own "peak responsibility." Then the companies developed a new cost rationale of price differentiation.

Utility companies now use the noncoincident demand as a basis of joint cost allocations. Using this method of cost measurement, they divide the joint costs according to the maximum class demands for service. The maximum demand of each buyer class is measured separately. A brief period of time usually is chosen for the demand measurement; the largest fifteen- or thirty-minute period of consumption commonly is chosen as the daily or monthly maximum demand for electric service. The separate maximum demands of buyer classes usually do not occur during the same hour of the day, or during the same day or month of the year. Yet, even though the maximum demands of the several classes occur at different times, they are added together to determine the aggregate noncoincident demand. Then the maximum demand of each buyer class is expressed as a ratio of the aggregate maximum demand; and these ratios determine the joint cost allocations for the buyer classes. Both the companies and the commissions accept this method of joint cost allocation.[10]

Limitations of Cost Allocations. There is no perfect, unassailable allocation of joint utility costs. If each class of buyers is served from its own separate production and distribution plant, there is no problem of cost allocations. But the same plant is used to serve the several classifications of buyers, because the service can be produced most economically with a single plant. These economies of joint production are not realized for one service, but for the whole output. Just as the economies of joint production are functions of the whole output, so the joint costs are connected with it. Because the joint costs are not incurred for separable classes of service, they cannot be allocated objectively to the separable outputs. Any allocation of joint costs is an arbitrary allocation.*

Utility companies necessarily must choose either arbitrary allocations of joint costs or no allocations at all. Telephone companies apparently are unwilling to make any allocations of joint overhead costs. At least there is no evidence of an effort on their part to measure the total average costs for their several kinds of service.† They do not present cost studies to explain the price differentiation, for instance, between one-party and two-party residential services, or between business and residential services.[14] If the telephone companies impute joint overhead costs to the several service classifications, they apparently do it according to the demand differences of the services.[15] Telephone systems seem to be more honest than the electric and gas companies about price differentiation: they do not try to hide discriminatory pricing under a cloak of arbitrary cost allocations.

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* To emphasize the difficulty of cost allocations for railroad service, Hadley once said that "God Almighty did not know the cost of carrying a hundred pounds of freight from Boston to New York." [11]

† Commissions consider cost allocations, however, between toll and local service. Because toll calls are concentrated among a small percentage of the local subscribers, commissions do not want all local subscribers to pay part of the toll costs. Consequently they and the independent telephone companies prefer a station-to-station instead of a board-to-board allocation of the joint toll-local costs.[12] The station-to-station method allocates a share of the joint switching facilities to the toll business. Facing an extensive toll-rate investigation by the Federal Communications Commission and the state commissions, AT&T agreed in 1942 to accept the station-to-station basis of cost allocation.[13]

Gas and electric firms do not hesitate to make or to propose joint cost allocations for their service classifications. But their method of joint cost allocation—the noncoincident demand method—is arbitrary like any allocation procedure. Under this method the joint costs are prorated according to the separately measured purchases of each buyer class. The economies of joint production certainly are not functions of these diverse peaks in sales! There is a further weakness in the case of the utility companies: they choose only one of several possible peak periods of sales. The largest fifteen or thirty minutes of consumption measures the peak consumption for a single day or a month. And the maximum consumption for a year or a business cycle usually is ignored. The cost allocations, moreover, are not independent of the prices that they are supposed to determine. The price structure is taken for granted, and the cost allocations are based on the maximum amounts of service that the different classes of buyers are willing to purchase at the prevailing prices. Indeed, the cost allocations can vary inversely with the prices for any customer classification, increasing as the prices decrease and decreasing as the prices increase. If the prices for a customer class are reduced, the customers are willing to buy more service; the maximum demand of the class increases. This increase in the maximum demand calls for a larger cost allocation to the customer class, unless the maximum demands of other buyer classes increase at the same rate.

Giving further attention to the cost-price relations for buyer classes, companies argue sometimes that differences in the load factors of buyer groups are a good basis for price differentiation. They usually do not compute joint cost allocations according to load factors. Instead, they point out the relation between load-factor differences and price differences; and commissions accept this rationale of price differentiation.[16] There is a real basis for this reasoning. Being a ratio of the average consumption to the maximum consumption during any time period, the load factor measures the fullness of utility plant use. If all buyers, for instance, have 100 per cent load factors, the utility plant is fully used. Thus, when a buyer class has a high load factor, it uses the utility plant more economically than one with a low load factor. If separate plants are built for each class of buyers, the overhead cost for each unit of output is higher, other things being the same, when the load factor is 40 per cent than when it is 80 per cent. Differences in load factors, consequently, show sensible differences in the service costs between buyer classes, even if the cost differences cannot be determined precisely.

Price structures do not always conform to load-factor variations. One example is gas service for space heating. This is seasonal business and, consequently, the annual load factor of the space-heating customers is low. At least the annual load factor of domestic cooking service is higher than that of space-heating customers. But the price of gas for cooking uses is far higher than that for space heating. The cost of coal or fuel oil, which is the alternative cost of heating homes and buildings, influences the space-heating prices more than load-factor conditions. Utility companies, moreover, are inclined to take short views of load-factor measurements. They compute daily or sometimes annual load factors; but they never study the cyclical variation of load factors. Yet a ten-year load factor can be much lower for industrial customers than a daily or annual load factor. During a depression the purchases of industrial and commercial buyers usually decrease more than those of domestic buyers. Between 1929 and 1933, for instance, the industrial sales of electricity declined more than 25 per cent, whereas domestic sales of electricity increased. If load factors are used for cost and price differentiations between buyer groups, they should be calculated for both long and short periods of time.[17]

CLASS-PRICE DISCRIMINATION

Company studies of cost differentials clearly do not prove that class prices of service are nondiscriminatory. The firms simply cannot present convincing evidence that the price differentials are not larger than the cost differentials for the several kinds of service. So there is still a basis for the belief that companies, guided by demand conditions, have a discriminatory pattern of class pricing. In several ways the conduct of company managers suggests a noncost basis of price differentiation. They often use a soothing phrase, such as value of service, to explain some differences in prices. Or they show a preference, as described in the previous chapter, for price changes where the increments in total revenue exceed those in total cost.

Conditions of Price Discrimination. Several conditions control the opportunities for price discrimination. Monopoly power is a basic necessity of effective price discrimination; having a monopoly, a seller is free from competitors who can upset customer classifications and price differences that are sources of profits. Differences in consumers' elasticities of demand are another primary economic basis for discriminatory pricing; these differences are discussed extensively in this chapter. This kind of pricing is dependent, too, on the managerial ability to subdivide the market. Street railway and bus companies, for instance, usually are unable to classify buyers. Even though some riders are willing to pay higher prices than others, managers of transportation firms cannot readily work out a way to differentiate between the persons who ride in the same car or bus. As a further condition of discriminatory pricing, companies must consider the buyer reactions to different service classifications. Where a real difference between two kinds of service is apparent, the company may not be troubled with many buyer complaints. A difference in consumer uses of utility services is a common and often a tolerable basis for buyer classifications. Buyers usually accept such broad classifications as industrial and domestic electric service; but they do not like market subdivisions for lighting, refrigeration, cooking, or other domestic uses of electricity when the same wires bring the electricity for all uses. Finally, the special costs of service classifications limit the number of market subdivisions. A separate service classification for each electric appliance, for example, requires many meters for each home and extra costs of meter reading and billing.*

Nontransferability of service between the buyer classes is a further condition of price discrimination.[18] If the commodity can be transferred from buyer to buyer, the consumers in the low-price classifications can afford to resell their service to the buyers in the high-price classifications. The benefits of price discrimination go, thereby, to some buyers rather than to the company. But utility services are not easily transferred from one buyer class to another; technical conditions of service distribution usually prevent the transfers.[19] Electric, gas, water, or telephone service is consumed on the premises of the buyers; and the lines to one buyer are not readily extended to the homes and establishments of other buyers. These services are almost as nontransferrable, indeed, as medical and dental services.

Elasticity of Demand.[20] Differences in the price elasticity of demand are the most important conditions of discriminatory class pricing. First, the utility company wants to distinguish between the buyers who have an inelastic and an elastic demand for service. To discriminate effectively and to get more earnings, the firm wants to put the buyers with inelastic demand in a separate class; these consumers usually do not get voluntary price reductions, for thereby the company would lose earnings. This is true because these buyers spend less for utility services as the price decreases. Second, the company wants to distinguish between other buyers according to the degree of their demand elasticities. Even if a group of buyers has only a slight elasticity of demand, the expenditures for utility service increase as the price decreases. But these increases in consumer expenditures, like the elasticity of demand, are small. To maximize the addition to total revenue, the utility company offers the largest price reductions to the consumers who have the highest demand elasticity.

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* In nonutility industries the number of buyer classifications is limited by the number of sellers. When a large number of sellers operate in a market, a single firm can sell its output at the market price. But a monopolist can create buyer classifications and practice discriminatory pricing, because there are no other sellers from whom the buyers can purchase service. Classification of buyers depends on the seller's control of the output and the market prices.

The general relationship between price differentiation and differences in demand elasticity can be readily demonstrated.[21] In Figure 16 there are two classes of buyers whose demands for service are represented by the average-revenue curves, AR_1 and AR_2; MR_1 and MR_2 are the marginal-revenue curves for the two consumer classifications. Both the average-revenue curves are elastic,* but one of them is more elastic than the other. The choice of two elastic curves for the illustration demonstrates that discriminatory pricing is based on differences in the demand elasticities. Only two buyer classes and two demand curves are used in this example. This limitation of buyer classes simplifies the illustration. Yet the case of discriminatory pricing can be described, of course, with many buyer classes; the principal condition still is a difference in demand elasticities. Finally, the costs of service, represented by the marginal-cost (MC) and average-cost (AC) curves, are assumed to be the same for both consumer classes.

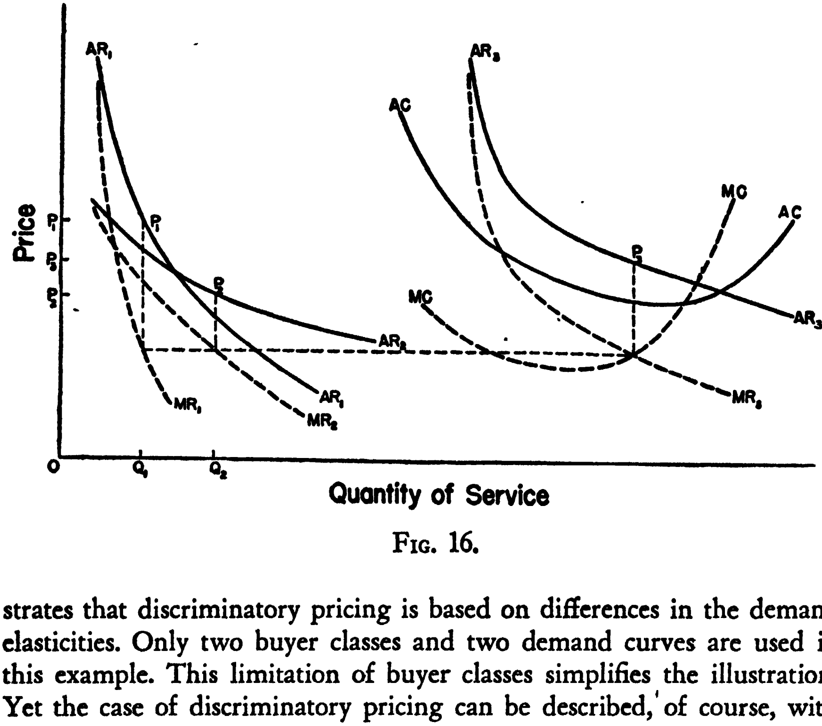

FIG. 16.

The average-revenue curves, AR_1 and AR_2, are added together to obtain AR_3, the composite demand curve for the company's service.

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* This is evident because both marginal-revenue curves in Fig. 16 slope to the right, i.e., as the prices are reduced, the company receives increments in total revenue from both buyer classifications.

The marginal-revenue curve, MR_3, is derived from AR_3. (To avoid congestion of the diagram the AR_3, MR_3, AC, and MC curves are shifted to the right on the diagram; there are really two diagrams with the same price scale.) If the monopolist wants to fix a single price for all kinds of service, the price, P_3, is determined by the intersection of the MC and MR_3 curves. Similarly, the monopolist can determine the discriminatory prices for the two buyer classes according to the intersection of MR_3 and MC. A line drawn parallel to the x axis and through the intersection of MR_3 and MC cuts MR_1 and MR_2 at Q_1 and Q_2 respectively. After the intersection points are located on the MR_1 and MR_2 curves, perpendicular lines are drawn to the AR_1 and AR_2 curves. The prices, P_1 and P_2, represent the discriminatory class prices.

P_1 is different from P_2 because the elasticities of the average-revenue curves are different. Differentiation of the class prices is proportionate to the differences in the demand elasticities. If the elasticity of demand for utility service is the same for the two classes of buyers, their average-revenue and marginal-revenue curves have the same slope. And if the general theory of monopoly pricing is followed, the prices for two service classifications are the same. But when there is a difference in the elasticity of demand, the monopolist wants to restrict sales to the buyers who have the smallest elasticity of demand, and to increase sales to those with the largest elasticity of demand. As long as the marginal costs are assumed to be the same wherever the sales are made, sales are sought where the increments in the company's total revenue are largest. And prices are adjusted so that marginal revenue is the same at the output limit for each buyer class.

The fixed costs of plant operation do not affect the choice of the class prices that are shown in Figure 16. But the marginal costs of service do affect the choice of the two prices. This does not mean, however, that the utility company does not want to get enough revenue to pay both the variable and fixed costs of operation. Actually discriminatory pricing increases the total revenue. Getting more total revenue, the company has a better chance to cover the fixed costs of operation. When the class pricing is done in a discriminatory manner, the firm collects more revenue from some buyers than from others; some buyers cover more reasonable costs of service, including fixed costs, than other buyers do. Yet this does not mean, as some managers and engineers seem to think, that allocations of joint overhead costs determine the class prices.

Figure 16 describes a simplified case of price discrimination. The uniform prices for the two classes, P_1 and P_2, are not the common kind of prices for utility services. These are uniform prices—straight-line prices in the language of utility rate making—for each unit of output; P_1 is charged for each unit of output OQ_1, and P_2 is charged for each unit of output OQ_2. As we shall see in the next chapter, utility companies usually have schedules of prices instead of uniform prices for each service classification. We must think, then, of P_1 and P_2 as "average" class prices for utility service.

The same marginal costs are assumed for both kinds of service so that attention can be focused on the demand elasticities. But this assumption, too, is unrealistic. Measured with the real facts of service production, the marginal-cost curve for one buyer class is likely to be lower or higher than that for other service classifications. When the probable differences in marginal costs are taken into account, the marginal cost-marginal revenue rule of price differentiation still holds. But the procedure of price determination is not the same as in Figure 16. Instead, the prices for each service classification are determined individually; equations of the marginal-cost and the marginal-revenue curves for each buyer class determine the prices.[22] When the earnings from each buyer class are maximized, the total earnings of the company are maximized. And when the marginal costs are different for several buyer classes, the marginal revenues are not equal at the several class limits of output. But class price differentials still are controlled partly by differences in demand elasticity.

Differences in Demand Elasticity. Before the class pricing of utility companies is called discriminatory pricing, it must be demonstrated that the price differentials are related to the differences in demand elasticity. The lowest prices must be found where the demand is most elastic and highest prices where the demand is inelastic or only slightly elastic. Allowance must be made for one fact: precise comparisons of prices and demand elasticities are not easy to make. Mathematical measurements of the demand elasticities of different utility services are not available. But the apparent differences between demand elasticities can be compared with the price differentials.

If the comparisons are made within the range of prevailing prices, the industrial power customer seems to have a more elastic demand for utility-company electricity than that of domestic and commercial lighting customers. For lighting service the residential or commercial buyers do not turn quickly to such alternatives as candles or kerosene lamps; consumers believe that these alternatives are distinctly inferior substitutes for electricity. Nor do these small buyers build their own electric plants, unless the electricity prices for lighting service are considerably higher than the prevailing prices. But the domestic lighting use of electricity, for which demand seems to be inelastic, is only a part of total domestic use. More alternative services are available for electric cooking, refrigeration, and water heating than for electric lighting. In cooking, water heating, and refrigeration service gas is a near substitute for electricity; and iceboxes can be substituted for electric refrigerators.[23] Yet, even when all the domestic uses are considered, the demand elasticity of residential consumers cannot be very high at any price. Use of vacuum sweepers, electric stoves, refrigerators, and some other appliances is affected more by the prices and the efficiencies of the appliances than the incomes of the buyers. Before a consumer buys an expensive appliance, he probably thinks more about its quality and price and his own income than about electricity prices. And after the domestic buyers are accustomed to electric appliances, their demands for these electricity uses often become inelastic.

More attention is given to the price of electricity by the industrial customers and the large commercial buyers than by the domestic buyers. If sales are to be made to industrial buyers, the prices of the company must compare favorably with those of other sources of light, power, and heat. The industrial buyers, as well as the large municipal buyers of electricity for street lighting, can construct their own electric generating plants.[24] Likewise, some large commercial buyers, such as department stores, can install their own electric systems; they can use Diesel generating plants.[25] Electric company managers frequently speak of the industrial and large commercial sales as "competitive" business. One official of an electric company, defending the managerial right of price-structure control, says that industrial buyers "are amply able to take care of themselves." [26] Some differences in industrial and domestic prices for electricity clearly can be explained by the demand differences between buyer classes.

Industrial and space-heating buyers apparently have an elastic demand for either manufactured or natural gas. Prices for these uses are controlled, for the most part, by coal and fuel oil prices. Some gas-rate schedules for house-heating service even contain a provision, in fact, for gas-rate adjustments as the price of fuel oil changes. A rate schedule may specify, for instance, a 5-cent increase or decrease per M.c.f. in the gas price when a 1-cent increase or decrease occurs in the gallon price of fuel oil.[27] On the other hand, the gas demand for cooking and water heating seems to be less elastic than that for industrial and space-heating uses of gas. When expensive appliances must be purchased to utilize gas, appliance prices and family incomes often have a greater effect than the price of gas on the expansion of a new service output. Taken together as a class of consumers, the domestic buyers of gas, like the residential buyers of electricity, seem to pay higher prices than other gas consumers because they have either a low elastic demand or an inelastic demand for service.

Telephone companies do not try to compute the total costs that are incurred to serve the several kinds of local subscribers. Ignoring possible cost differences, the companies indirectly admit that differences in demand elasticities determine the class prices for local telephone service.* Business establishments seem to have a less elastic demand for telephone service than that of many residential subscribers. Most business firms think that telephone service is a necessary part of their business operations; but many families can and do forego it.[28] Among the residential subscribers the "superior" service is single-party service. Any subscriber prefers to make his calls immediately; he does not wish to wait until other subscribers complete their calls. But some persons more than others consider immediate telephone service indispensable and are willing to pay more for it. If a telephone company furnishes only single-party service, some families are not willing to pay the price of it. Wanting to attract these persons, the telephone system introduces two- and four-party service at lower prices. The demand of the users of this service seems, then, to be more elastic than that of the single-line subscribers.

Residential buyers as well as many small commercial consumers clearly show evidence of an inelastic demand for water service. Even if water prices were raised considerably above their present levels, most consumers would not sharply reduce their water consumption. Some of them do not curtail it at all as the prices change. When water companies need more revenue, they can increase the prices for domestic service. If they live in villages, the domestic consumers can dig their own wells; but the city consumers of water do not have this alternative choice. Within some price limits the large industrial buyers, too, may have an inelastic demand for public water service. Yet, if the water company charges high prices for industrial service or does not give the industrial consumers lower prices than the domestic buyers, some industrial firms will develop their own water supplies.

The Evolution of Class Pricing. The history of class pricing, evolving slowly and varying somewhat from company to company, contains an enormous amount of factual information. No one can record every motive or hope, every guess or controlled calculation that was a part of the history. Even all the changes in the buyer classifications and price differentials cannot be readily summed up. At least I shall not try to do it. The development of class pricing was an experimental process; some managers, taking chances on uncertain cost and demand conditions, tried out the new service classifications and revealed profitable opportunities for price differentiation to the less venturesome managers. And it was a slow process; utility companies did not develop their class pricing in a day or year. In Figure 16 the class prices, which were based on the demand elasticities of buyer classes, were set simultaneously. But the companies, making successive historical additions to their buyer classifications, developed their price structures in a piecemeal fashion. Beginning with a single buyer classification, say, in 1910, the company added a new service classification in 1913, another in 1915, and so on until the present total of market subdivisions finally evolved.

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* Contrasted with other utility companies, telephone systems are confronted with a peculiar condition of class-price differentiation. The class prices for telephone service sometimes are interdependent. A residential subscriber can choose single-line service, or he can share a line with one, two, or three other subscribers. The price for any one kind of local service affects the demand for the other kinds.

This historical development of price structures generally followed the rules of discriminatory pricing. Given the prices at any time, a utility company could offer a price reduction to the existing buyers. But the managers might think that these buyers had an inelastic demand for the established uses of service. If this was true, the firm incurred a reduction of total revenue and earnings by giving a price reduction to the old buyers. Other price reductions could be more attractive. Creating a new service classification and offering low prices to the new customers, the company managers anticipated more profits; the company retained the revenue from old buyers while it sought new buyers and more revenue elsewhere. Managed in this manner, the evolving structure of class prices conformed to the essential rule of discriminatory pricing: the prices were differentiated according to differences in demand elasticities. At the same time the companies could treat a new class of service as an incidental business, justifying price reductions where the increments in revenue were expected to be greater than the cost increments.

New classes of buyers often were created in conjunction with technological innovations. When cost economies were available from a technical change, a utility firm naturally was encouraged to offer price reductions on new kinds of service. Many technical economies could not be realized, in fact, unless the utility companies developed larger scales of operation. The cost economies of technical improvements often explained the introduction of some classifications of electric and gas service. Industrial and large-buyer classifications of electric service, in particular, were created and were given voluntary price reductions from time to time, because technical innovations afforded profitable opportunities for more sales and more price differentiation.

The relation of technical changes and discriminatory pricing is illustrated in Figure 17. There are, as in Figure 16, two classes of buyers; and one class has a smaller demand elasticity than the other for service.

The average-revenue curve, AR_3, is the sum of the average-revenue curves of the two buyer classes; and the marginal-revenue curve, MR_3, is derived from AR_3. Before the technical change appears, the marginal costs for the existing plant output are illustrated by MC_1. Let us suppose, too, that there is just one class of buyers before the innovation appears. They pay an "average" price of P_1, and buy an OQ_1 quantity of service.* Considering the prevailing cost and demand conditions, the company cannot afford to create a new classification and to offer a price reduction to the buyers who have the average-revenue curve, AR_2. This kind of price differentiation cannot be practiced, because MC_1 is higher at all times than MR_2. As long as new production economies are not available and as long as MC_1 represents the cost behavior of service production, the company incurs an earnings reduction when a new low price is fixed for the AR_2 buyers.

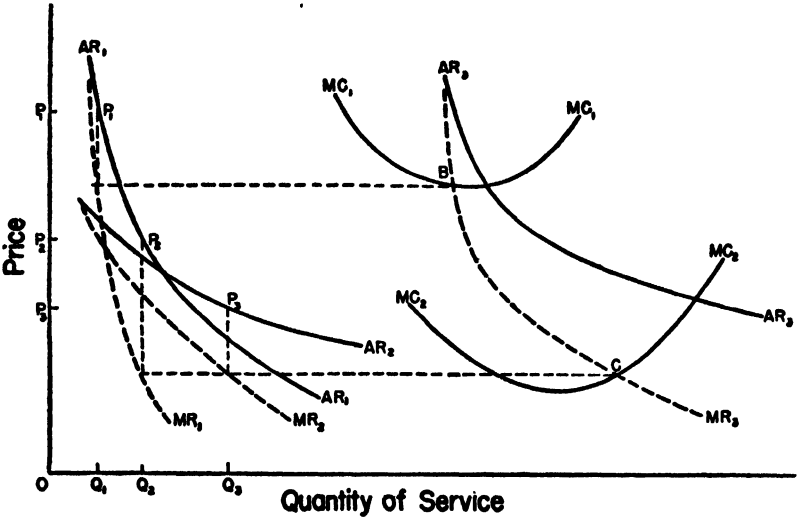

FIG. 17.

An innovation appears and the marginal costs of the new plant production are illustrated by a new marginal-cost curve, MC_2 of Figure 17. Now the company can afford to introduce a new classification for the buyers who have the AR_2 demand. Determination of the two class prices follows the procedure of Figure 16. If, as in the case of Figure 16, the same marginal costs are assumed for the two service classifications, the differentiated prices are determined in the following manner: from the intersection of MC_2 and MR_3 (point C) a line, which is horizontal to the x axis, is drawn through MR_1 and MR_2. And P_2 and P_3 are the average prices for the two classes of buyers. The buyer class with the lowest demand elasticity, the class that has the AR_1 curve, also gets price benefits from the innovation. They get slightly lower prices because they have a slightly elastic demand. But, if the original buyers have an inelastic demand for service and if the company management is guided wholly by profits as prices are fixed, only commission action can get a price reduction for them.

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* The price, P_1, is determined by the intersection (point B) of the MR_3 and MC_1 curves. Because there is only one class of buyers at this time, this is the same thing as the equation of MC_1 and MR_1. But P_1 is not necessarily determined by an equation of marginal cost and marginal revenue. Exercising control of monopoly pricing, a commission can equate P_1 to the average reasonable costs of service. If P_1 is a fair price rather than a monopoly price, the reasoning about the later price differentiation is not changed.

Managerial Limitations. In Figures 16 and 17 the class prices were based on imaginary revenue and cost curves. As they developed their class prices in a piecemeal manner, the managers of utility companies did not have exact knowledge of demand and cost conditions. They did not measure marginal costs over considerable ranges of output; rather, as a new classification was contemplated, they apparently made rough estimates of probable increments in total company expenditures. Nor did they know precisely how much new service could be sold at various prices. Both the position and the elasticity of the new demand curves were incompletely known. Company managers and engineers could estimate the buyers' responses to new prices and the increments in total revenue. Or they could experiment with price reductions for a new service classification; beginning with one price level, they could gradually reduce the price level as the experience with buyer responses indicated that further price reductions might continue to increase the earnings. Class pricing was bound to be done imperfectly. Yet, despite the incomplete knowledge of demand and cost conditions, the companies did use monopolistic and discriminatory principles of pricing.

Commission control of output and earnings also limits the class pricing of utility firms. Companies usually do not try to get all possible increments in earnings, either because they are satisfied with the prevailing earnings or because the earnings increments can be wiped out by commission regulation. Managerial administration of prices is concerned largely with price reductions. If the companies are completely free to maximize their earnings in any way, they can increase the prices for buyers who have an inelastic demand while reducing those for buyers with an elastic demand. Commissions usually approve price reductions for the latter class, but they investigate proposed increases in prices. If the management of a company anticipates a certain revenue increment from a price reduction and the demand turns out to be less elastic than the expectations, the firm is not assured an opportunity to increase the price and correct the mistake. Utility companies cannot freely adjust their discriminatory class prices to changes in demand and cost conditions. The service obligations also put restrictions on the discriminatory pricing. When a company serves some industrial customers at a low price, it must serve other buyers in the industry at the same price; a utility firm can practice discriminatory pricing, but it cannot "pick and choose" the customers. Because the managers must "serve all who come," they do not have the same opportunity to control the monopoly output that the unregulated monopolists have. Even if the marginal costs increase for a separate classification, the company still is obligated to serve all who come and is not always given a price increase that compensates for the cost increases.

Commission Opinions. Regulators do not allow companies to choose any buyer classifications that they want. Commissions approve some buyer classifications and price differentiation, particularly the conventional distinctions between domestic, commercial, small industrial, and large industrial customers. But they limit the number of buyer classifications. Even if many different uses of utility service are conceivable, regulators do not approve separate service classifications for every use.[29] The same kind of consumers, they believe, should have the same price schedules.[30] In the case of industrial gas, water, or electric service they do not want different price schedules for every industry. And sometimes they object to differences between class prices.[31] Commissions seem to make a loose distinction between acceptable and unacceptable class pricing, though they are guided more by the customary buyer classifications and common price differentials than by an understanding of discriminatory pricing.

Commissioners do not understand the discriminatory nature of class prices. Misguided by the cost rationale of the companies, they do not see the relation between discriminatory pricing and demand elasticities and readily approve class prices that are based on "competitive" conditions.[32] When price differentials are based on competitive conditions (e.g., the competition between gas and fuel oil or coal for space-heating sales), they are based on the costs of alternative services. Based on competitive conditions, price differentiation comes to the same thing as price differentiation according to demand elasticities. But regulators are not aware that "competitive" pricing is discriminatory pricing. The Wisconsin Commission reasons strangely in this connection: it does not always believe that competition is a sufficient justification for a separate service classification; but if a service classification is based on competitive conditions and the competition disappears, the service classification becomes discriminatory.[33] Competitively determined prices are not discriminatory;[34] in the absence of competition the same prices are discriminatory! The Pennsylvania Commission misunderstands discriminatory pricing in another way. Arguing against further price differentiation, this commission says that it cannot base rates on ". . . what individual customers in each class *can* pay, for obviously this would lead to the situation where . . . the less prosperous consumer's service would be paid for, indirectly, either by his more fortunate neighbors or by the public utility itself."[35] This commission sees price discrimination between individual buyers, but not between customer classes. Like most commissions, it does not realize that both kinds of price differentiation can be discriminatory.

SOCIAL ACCEPTANCE OF CLASS PRICING

When many persons evaluate the price structures of utility companies, their most reproachful criticism is the charge of discrimination. Discriminatory pricing is wrong, as is recognized by consumers who pay the high prices, regulators and lawmakers who commonly prefer the democratic standard of equality, and students of social problems who object to the acquisitive character of price differentiation. They can tolerate price differences that are based on measurable cost differences, but not higher charges for some consumers merely because they have no alternatives but to go without service. Yet, as discriminatory pricing is described so far in this chapter, it is simply a technical concept. It is a method of pricing. It is price differentiation that is based on demand differences—on the differences in demand elasticity. The technical fact or method of discrimination obviously is not the same thing as a social evaluation of the pricing. To determine the desirability of such pricing practices, the commissioners and judges naturally must go beyond pricing methods and look at the social effects of the prices. They need social standards of evaluation as well as social facts about prices. Choosing one standard and emphasizing some facts, they may eliminate all discriminatory prices; choosing another social standard and taking account of other facts, they can tolerate some kinds of price discrimination.

Sometimes utility companies should be allowed to practice discriminatory pricing. Price differentiation according to demand differences is one way to give a company a reasonable return. Some companies cannot obtain a return unless they are allowed to discriminate between the classes of customers. And the consumption of service is larger with discriminatory pricing than with a nondiscriminatory policy. Even when a reasonable return can be obtained without price discrimination, more utility service is consumed when class prices are used than when all utility service is sold at a uniform price. But an enlargement of service output is not the only possible objective of public utility regulation. Sometimes the regulator wants to reduce the prices of the buyers who have an inelastic demand for service; the regulator can prefer a reduction of price differentials to an enlargement of service consumption. This is a problem in distributive justice.

Necessity of Class Pricing. All utility companies need some minimum amount of plant before any service can be performed. This often necessitates a large investment. Railroads afford a common example of this condition; a railroad company obviously needs a roadbed, two lines of steel rails, some ballast, a certain number of ties, telegraph lines, fences, highway crossings, and other equipment before it has an operating system. Such a minimum amount of plant requires a considerable investment for every mile of line. Natural gas lines are other examples of this minimum-plant condition. No company wants to build a 1-inch or 2-inch gas line from western Texas to Chicago. An 8-, 10-, or 12-inch line is the sensible minimum for investors; the original gas line to Chicago, which was completed in 1931, had a diameter of 24 inches. When prices are uniform for each service unit, perhaps the minimum gas line or railroad line is incompletely used. And the company returns from uniform pricing do not justify the investment in the plant. On the other hand, the earnings and plant utilization can be increased with discriminatory pricing. Consequently, the only way to get a reasonable amount of earnings is through class prices that can be a means of minimizing deficits as well as maximizing profits.

When price discrimination is used to obtain reasonable earnings, Figure 18 describes the pricing problem. The cost and revenue curves are like the curves used in Figures 16 and 17. But there is one significant difference. At all times the average-cost curve is above the average-revenue curve, AR_3. Since no single price of service is so high as the average cost of service, investors cannot afford to invest in the plant as long as regulators require a uniform price for the sales. The best single price, P_3, is less than the average cost; this price minimizes deficits under a uniform price policy. But investors are interested in something more than minimum deficits. If this company, on the other hand, is allowed to discriminate between buyer classes, it may receive a return that justifies the plant investment. This is true when the total revenue with class prices, P_1 and P_2, is at least as high as the total cost of the outputs OQ_1 and OQ_2. If the company can restrict sales to the AR_1 class of buyers while more service is sold to the AR_2 class, it may be able to eliminate the deficits of uniform pricing. When service is sold at the two prices P_1 and P_2, the total revenue is larger than it is with a single price. This revenue increment from price discrimination can be large enough to cover the deficits of uniform pricing. The choice is between no output at all and the use of a discriminatory price structure.

The installation of technical changes by utility companies depends, in part, on the freedom that managers are given to use discriminatory class prices. Figure 17 describes the relation of class pricing and technical innovations. Even if the buyers have an inelastic demand for service, a company adopts some kinds of cost-reducing changes. The company wants to reduce the production costs of the prevailing output. But some technical economies are realized only when the scale of company operations increases. To reach a large scale of output, a firm often must develop new uses for its service. Promoting new uses of utility service, the company must create one or more new, low-price classes of service.

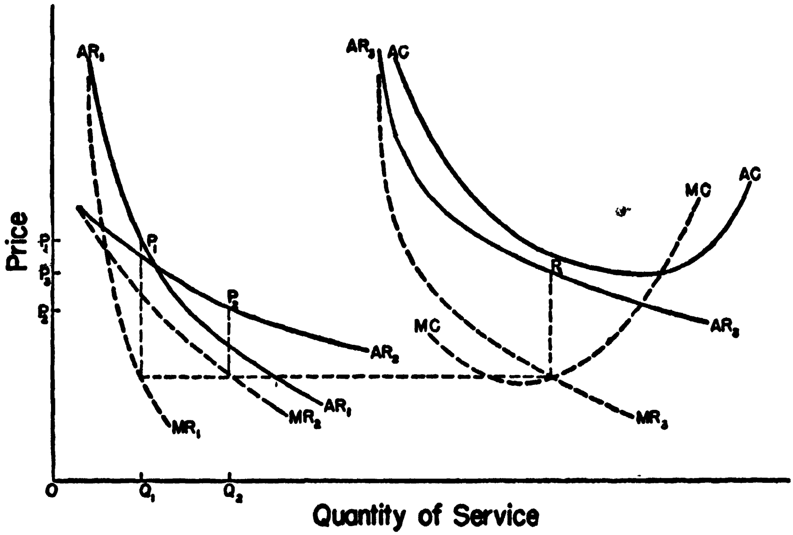

FIG. 18.

Enlargement of Output. One objective of commission regulation can be the expansion of the intensive and extensive limits of service consumption. Discriminatory pricing is a means of achieving this objective. Except when the demand curves of the buyer classes have special shapes,[36] the price-discriminating firm produces more service than an identical firm using a uniform price. This output difference can be explained, of course, by the price differentiation according to demand elasticities. When price reductions are given to buyers who have an inelastic demand, more service is consumed. Unless the demand is perfectly inelastic, sales always increase as prices decrease. But the buyers with an elastic demand increase their purchases at a faster rate, as prices are reduced, than the inelastic-demand buyers do. Consequently when price differentials are adjusted to the differences in demand elasticities, the production of services can be maximized.

Denial of Price Discrimination. More profits for a prospering, privileged company are poor social excuses for price discrimination. Needing additional earnings to get a minimum reasonable return or seeking to attract new customers so that a larger and more economical scale of production can be justified, a company may have defensible social reasons for discrimination. But price differentiation for simply money-making purposes can be supported only in business terms; such pricing is purely acquisitive, and has no public-interest explanation. Even the purpose of larger consumption, as discussed in the previous paragraph, cannot be upheld by social reasoning as long as it is accompanied or guided by profit taking; in some situations a commission can defend intelligently more and wider consumption of service than is achieved with discriminatory prices, but it should not allow the discriminating firms to obtain more than reasonable returns. In private hands a discriminatory pattern of prices is directed toward investor and managerial ends rather than the consumer, the public-interest ends.

When private managers control price changes, cost economies of plant operation are translated primarily into price reductions for the large buyers or the new buyers. As the pricing history of the gas and electric industries shows, cost economies are turned into low prices so that buyers, who use alternative services, are attracted to utility services; the large price reductions go to the buyers who have an elastic demand for service. On the other hand, when buyers have an inelastic demand for utility service, they receive no price reductions at all unless the management thinks that good consumer relations require some changes. Or if their demand is only slightly elastic, the class price reductions never are large. The small and established buyers, to whom alternative services are not accessible for economical prices, are neglected because the firm cannot get additional profits by granting lower prices to them. Private management of price discrimination, which is the historical and current source of such pricing, is controlled primarily by profit prospects rather than social consequences.

Revisions of Price Structures. Commissions should limit the demand-price exploitation of small and habitual buyers. These buyers should not always be denied price reductions just because they cannot build their own electric plants, dig their own wells, or buy expensive equipment for space heating with gas. The need for earnings and price regulation varies, in part, with the demand elasticities of different buyer groups.

Large industrial buyers of gas, water, and electricity often can bargain effectively with utility companies; they do not need much price protection from commissions. But the small domestic and commercial consumers need protection. Since commissions are created primarily to safeguard the buyers who have only inferior alternatives to utility services, they should give more attention to price-structure revisions, and try to reduce the prices for buyers who have inelastic demands for these services.

Commissions have authority to undertake general revisions of the class-price structures, but they do not want to use the power. They know that they encounter much opposition from the buyers whose prices are increased. Forced to pay higher prices for gas and electricity, some industrial buyers probably argue that their own commodity prices or market positions are affected by the higher utility prices; and house-heating consumers of gas point out that they bought expensive furnaces because gas prices were reduced relative to coal and fuel oil prices. Yet the commissions need not make general revisions of price structures. They can make successive revisions of class-price differentials as earnings reductions are ordered. In connection with earnings regulation, then, the commission can choose between two purposes of price regulation: the reduction of discriminatory prices and exploitation of some consumers, or the maximum service consumption for each price reduction.

Choosing an earnings objective different from that of the private companies, the commissions can uphold the traditional public purpose of earnings and price control. They can protect the buyers who have the greatest need for public-regulation. They can give most of the price reductions to the buyers who have no alternatives or only a few poor alternatives to utility-company service. If this policy is followed for electric, gas, and water service, the price reductions go largely to the small residential and small commercial buyers. When the same price policy is used for telephone service, the price reductions go to commercial subscribers and single-line residential subscribers. These are the telephone subscribers who seem to have the most inelastic demand for service. But commissions may want another price-revision policy for urban telephone service. The residential buyers of single-party residential service usually have more income than the buyers of two-party and four-party service. Observing this fact, the regulators may wish to give price reductions to the families who can least afford the service, the residential buyers of two-party and four-party service.

Chapter 27

Pricing Forms

BUYERS CAN be classified and prices can be differentiated according to demand elasticities. But differential pricing does not end here. More of it is found in the separate price schedules for the buyer classes. When utility companies began to operate, they often sold their services either at flat prices for each month, regardless of the amount consumed, or at uniform prices for all units. The flat price still is used for telephone service in villages; and a uniform price for each ride is the customary charge for urban transportation service. But the gas and electric companies now have many kinds of price schedules. The commonest characteristic of these schedules is a price reduction as the individual buyer's consumption increases. These quantity discounts frequently are expressed in a "block" schedule of prices: the buyer purchases one quantity of service at a certain price, another quantity is purchased thereafter at a lower price, and so on through several "blocks" of the price schedule. In addition some companies have a flat service charge or a minimum bill. A few general comments cannot begin to describe the numerous variations and complications in price schedules.[1] Residential buyers of gas and electricity have quite complex price schedules, but large buyers have intricate schedules containing many technical terms and special adjustments.

THE GENERAL CHARACTERISTICS

Two general considerations lie behind the formulation of utility price schedules. One of these is the cost allocation to the different service units that a buyer purchases. This is chiefly a problem of "assigning" overhead costs to different output units. Both the definition of the production unit and time variations affect the measurement and allocation of overhead costs.[2] The depreciation cost and the reasonable return, for instance, are overhead costs for the whole-plant output during a long period of production; but some labor expenses are overhead costs for the immediate output or the output of several months. Confronting these and other variations of the cost-measurement problem, a company necessarily must make arbitrary choices. The other consideration is the consumer demand and the enlargement of output. Managers and regulators want promotional price schedules; they want to expand the consumption of service.

Cost Allocations. Looking at its accounting records and considering the regulatory practices, a company can measure the total cost of service. The accounting records tell the "first" original cost or investment cost in lines, meters, and other special equipment that is used for all buyers. But no accounting system tells the firm how much the service cost is for each buyer; the costs cannot be broken down specifically for individual sales. Observing the general cost behavior, companies sometimes estimate the service costs of an average individual buyer.[3] Admitting the impossibility of perfect calculations, the management seeks a workable or sensible measure of cost behavior. Sometimes, too, it tries to make the most of a difficult situation, rationalizing the cost of service so that the established pattern of pricing can be explained. The costs of utility services are functions of buyer consumption, the number of customers, the time shapes of the buyers' demands, the amount of plant capacity that is needed to satisfy buyers at any time, the scatteration of buyers, and other variables. But companies cannot consider every variable. They must draw a line somewhere as they study the cost behavior. Consequently the attention of electric and gas companies, for instance, is concentrated on three kinds of costs: energy cost, customer cost, and readiness-to-serve cost.

Measured for a whole gas or electric system, the energy cost varies according to the service output. And by inference, therefore, the energy costs for individual buyers vary in proportion to their purchases. The coal cost of generating electricity or manufacturing gas is a part of the energy cost. Likewise, the payments of natural gas companies to gas well owners are energy costs too. But no rule can be fixed, of course, so that energy costs can be counted exactly. Judgment is sure to vary between companies on what costs are and are not functions of the short-term outputs of service. Making a practical choice, most firms apparently assume that energy costs are approximately constant for each unit of service.

Customer costs are treated as functions of the number of buyers. As the number of buyers increases or decreases, the total customer costs of the company are believed to increase or decrease. These costs usually include the expenses of reading meters, sending and collecting bills, and handling customer complaints. In addition they may include the depreciation cost, a reasonable return, and maintenance expense for such customer equipment as meters and service lines. To simplify the cost measurements, companies often assume that customer costs are the same for each buyer—at least for each buyer in a single customer classification. The companies know that some customers, who are cantankerous or do not pay their bills promptly, require more attention and cost the company more than the average customer. But the firms rely on an average solution as long as they are inferring the individual customer cost from the general behavior of customer costs. At any rate, they know that the complaining customer is even more obstreperous if he is charged for his complaints.

The readiness-to-serve costs, which sometimes are called the "demand costs" or "plant-capacity costs," commonly are treated as functions of the buyer demands. Providing plant capacity to satisfy the buyer demands for service, companies want to fix prices that are based on the consumers' "responsibilities" for plant investments. The total readiness-to-serve cost, a public utility version of overhead cost, varies according to the plant investment. All or nearly all of the depreciation cost, reasonable return, and taxes are included in the total readiness-to-serve cost. And it may include, too, some general costs and maintenance expenditures of the utility firm.

Imputation of the readiness-to-serve costs to individual buyers is the crux of the price scheduling problem. But before these costs are allocated to individual buyers, the total sum of them must be divided between the several classes of buyers. The managerial and engineering allocations of costs to buyer classes are discussed in the preceding chapter. Just as these costs are arbitrarily allocated to buyer classifications and are used to explain class price differentials, so they are arbitrarily used to compute or to defend the price schedules. Company managers usually assume that all buyers, except the strictly off-peak consumers, have a responsibility for the utility plant investments. They assume, furthermore, that the company holds itself ready to serve one buyer quite as much as any other buyer. Accepting this holding-out rule, they believe that the readiness-to-serve cost ought to be covered out of the revenue that each buyer pays for his first units of service. This reasoning, which the electric and gas firms actually try to follow as they fix prices, makes the readiness-to-serve charge as high or almost as high for the small buyer as for the large consumer.

Companies also try to tie up the readiness-to-serve cost with a typical buyer's demand for service. The individual buyer's responsibility for the existing plant capacity is inferred from his demand behavior. This makes the load factor, a rough measure of the time shape of buyer demand, an important factor in the relation of price schedules and service costs. And a related measure, the maximum demand, frequently is used to compute the readiness-to-serve charges for individual buyers. The maximum demands of consumer classes often are explanations of class price differentiation; but they are not regularly used to determine the class price differentials. The case is different for some price schedules: here the maximum demands of individual buyers are used to differentiate some prices. Price schedules for industrial consumers of gas and electricity often contain a separate readiness-to-serve charge. And the charge commonly is based on the maximum metered consumption during each month.

Output Enlargement. "Promotional" price schedules are favored for public utility service. When a promotional change is made in a price schedule, buyers are induced to purchase more service than they consume now. Expansion of service consumption is the important factor. Both the companies and the commissions like promotional price schedules. Commissioners believe that inducements for more service consumption are necessary characteristics of "scientific" pricing.[4] They want to increase the consumption of old buyers, and to develop new uses of service. Commissions prescribe the reasonable earnings for a company; then they ask for price schedules that give the consumers the largest possible amount of service for their money. Utility companies are interested in promotional price schedules for another reason; they like this kind of pricing because they can get additional earnings with it. They offer price reductions to buyers because the revenue increment is expected to exceed the cost increment.

Costs can be imputed to different service units so that a promotional price schedule is assured. A large amount of the readiness-to-serve cost can be assigned to the first service units for each buyer. Or the companies, disregarding variations in buyer consumption, can impute a fixed readiness-to-serve cost to each buyer. Whatever the method of cost imputation is, the costs are assignable to service units so that a descending scale of prices follows from the manipulated cost allocations. This is not a case of objective cost analysis. Rather, the cost allocations—the managed cost measurements—are determined by the prices that the companies and commissions want to charge. If an objective analysis of cost-price relationships is made, the costs of typical buyers are studied first, then the prices are fixed. In the case of promotional price schedules the arrangement often is the other way around. Considering how much service can be sold with various price schedules, the company managers choose a price schedule. Or the schedule grows up gradually; each new part is added when a further differentiation of prices promises an increment in earnings. Then, after the price schedule is chosen or is developed over a period of time, the company develops a cost rationale for it. A company is compelled to rationalize cost behavior for two reasons. Joint costs of production, which include at least a part of the readiness-to-serve costs, cannot be allocated except in an arbitrary manner. And if a price schedule is promotional and is designed to achieve a large output or even the maximum output of service, it is based necessarily on the consumer demand rather than the costs of service alone. It is a discriminatory form of pricing that the companies try to cover up with rationalized costs of service.

ELECTRIC AND GAS RATES

The list of pricing forms for gas and electric service is a long one, ranging from the flat price and other outmoded price forms to the complex three-part rates whereby a separate charge is computed for each of the three cost categories. Judged by their comments and past practices, managers and rate engineers of electric and gas companies favor a three-part rate—a fixed customer charge for everyone regardless of consumption variations, a charge based on the measured "demand" for service, and an energy charge for each service unit. They watch particularly the computation of the demand charges, which are designed to collect nearly all the fixed costs of utility services. At the same time the electric and gas companies do not want to antagonize customers with complex, confusing rates. The simple forms of pricing commonly are used for residential and other small buyers, and the complex—the "scientific"—price forms are reserved for industrial service and large consumers.

There are several reasons for the numerous and often complex gas and electricity prices. One is approval of the commissions, the benign commissions that freely accept managerial ideas of price determination. Another is the engineering influence on pricing policies. Engineers are largely responsible for the cost concepts on which the price schedules are based. Maximum demand is not defined as an economist defines it; rather, the maximum demand of a month is, say, the largest thirty-minute period of consumption. It is something an engineer can measure with a meter. Likewise, the load-factor concept is a product of engineering thought. And the engineers, untroubled by arbitrary cost computations, break down the joint production costs into separate cost categories. There is a further reason for numerous gas and electric price forms: the companies see many opportunities to increase their earnings with price differentiations. All these opportunities were not evident as soon as electric or gas service was available; they accumulated as the history of the industries, influenced by technical and demand changes, unfolded over a half-century period. As new uses of electricity and gas developed, the companies offered lower prices for the new uses, but did not reduce the prices for all uses. New and more complex price schedules were chosen to carry out the price differentiation.

Flat Rates. The flat rate is the simplest price form for gas and electric service. It is a fixed charge for a certain time period of consumption—commonly a fixed monthly charge for each customer. As an example of such a flat charge, the price of gas is $4 a month for each residential buyer; the actual gas consumption does not affect the monthly bill. Or it is a fixed charge for each fixture or for each separate service. Electricity can be sold for a fixed monthly charge for each street lamp; or gas can be sold at a fixed monthly price for each cooking stove, heating stove, or water heater.

There was a time when flat rates were frequently used. They were commonly used for natural gas service during the nineteenth century, the period when natural gas was plentiful and cheap and was transmitted short distances. Long ago, however, the use of flat rates was discontinued for regular gas or electric service. Flat rates encouraged wasteful uses of service. In the days when the natural gas rate for "sitting-room" stoves was, say, $1.50 a month, the cost of gas was the same whether the customer controlled the room temperature by opening a door or window or by shutting off the stove. Today the electric and gas companies, possessing expensive plants and incurring high maintenance costs, cannot afford to use flat rates and take the risk of service wastage. Consequently only a few special services, such as street lighting and the lighting of advertising signs where the service consumption does not vary much from day to day or year to year, have flat rates now.

Uniform Rates. When electric or gas service is metered, the simplest rate is a uniform or straight-line price for each service unit. A price of 7 cents a kilowatt-hour for electricity or 90 cents a thousand cubic feet of gas, for example, is charged whether one unit or many units of service are purchased. At one time the uniform rate was widely used for electric and gas service. Today it is rarely used. Like the flat rate, it is used where the demand behaves in a special way. When gas is sold, for instance, to space-heating customers, a uniform rate occasionally is used. The space-heating customers apparently are willing to purchase approximately the same amount of gas with a uniform price as with complex rate forms; they want enough gas to maintain comfortable temperatures in their homes.

As we shall see in the later discussion of the service charge, utility-company managers frequently assert that small or "convenience" buyers are served for less than cost when they are charged a uniform unit price for service. Following their customary cost analysis, utility firms say that these customers do not pay their share of the customer costs and readiness-to-serve costs. Companies, rate engineers, and commissions object to the uniform price for another reason: it is not a promotional price. Unlike a price schedule that is adjusted to a downward-sloping demand curve and is scaled according to the declining demand prices of the buyers, the uniform price does not facilitate an enlargement of output and earnings. This nonpromotional defect can be corrected with a block-price schedule.

Block Rates. No form of electricity and gas pricing is so universally used as the block rate schedule. When a block schedule of prices is the only price form for a service, it is called a "one-part" schedule. It is often used alone, particularly for small buyers. Or when a complex form is used, the block schedule is only one part of a two- or three-part schedule. An example of a simple block schedule for gas service is:

First	5,000 cu. ft. each month	$1.20 a M.c.f.
Next	10,000 cu. ft. each month	1.00 a M.c.f.
Next	10,000 cu. ft. each month	.90 a M.c.f.
Next	25,000 cu. ft. each month	.75 a M.c.f.
Over	50,000 cu. ft. each month	.60 a M.c.f.

Not only are block schedules extensively used for residential service, but also they are used frequently for commercial buyers of electricity and commercial and space-heating buyers of gas.[*] Having simpler pricing forms than electric companies, gas companies frequently use a plain block schedule for industrial as well as residential service. Some gas companies, in fact, use the same block schedule for all buyers, making the first blocks small enough to accommodate the residential and small commercial buyer.[†]

Gas and electric firms usually try to recover the customer costs and some "demand" costs (the readiness-to-serve costs) from the first block price or first two block prices of the schedule. The inferred cost behavior of service production is used to explain the descending scale of block prices: the unit cost of service decreases as a customer's purchases increase. Measured for a single buyer class, the customer costs vary slightly or not at all as a buyer's consumption changes. Furthermore, the companies assume that the readiness-to-serve (demand) costs, the plant-investment and plant-maintenance costs, vary according to the plant capacity that is available to serve the customers. Since the availability of plant is assumed to be the important factor about the fixed plant costs, the rate engineers do not believe that these costs vary with the increments in buyer consumption. (This belief ignores the obvious fact that continuing increases in demand eventually require more plant capacity and more investments.) According to their reasoning the plant is available to both the large and small buyers in a service classification. Consequently the readiness-to-serve charge should not be proportionate to purchases; and the small consumers should pay a larger readiness-to-serve charge, relative to their consumption, than the large buyers pay. That is the cost rationale for a descending scale of block prices. But the several kinds of costs—customer, readiness-to-serve, and energy costs—are not identified by separate parts of an ordinary block schedule. Since these costs are not specifically identified, the ordinary block schedule is a compromise between uniform pricing and the more complex two-part and three-part rates.

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[*] A step-rate schedule is a variant of the block rate schedule. The price is uniform for each unit of service, but the uniform price is reduced as the buyer's purchases increase. This is an example of the step rate:

7¢ a kw.-hr. when 40 or less kw.-hrs. are used each month
6¢ a kw.-hr. when 40 to 100 kw.-hrs. are used each month
5¢ a kw.-hr. when 100 to 300 kw.-hrs. are used each month
4¢ a kw.-hr. when more than 300 kw.-hrs. are used each month

The buyer gets some free service at the "turning points" of a step rate. For 40 kilowatt-hours the buyer's outlay is $2.80; but for 41 kilowatt-hours he pays only $2.46. Although this was a fairly common form of pricing several decades ago, it is a rare form today.

[†] When one block schedule is used for all kinds of customers, the initial blocks of service are so small that many residential and small commercial buyers are buying some service at the second or even the third block prices. When a block schedule has small initial blocks, it is known as a "quick-breaking" schedule.

The companies and commissions can choose many different block sizes and block prices for a schedule. Selecting these sizes and prices, they try to reconcile the inferred cost behavior with promotional pricing. If all or nearly all the customer and readiness-to-serve costs are accounted for in the first one or two blocks, the initial block prices can be so high that there is really no effective inducement for more consumption. When the preceding example of a block schedule is used, the buyer pays $6 a month for gas service before he reaches the next service block and a lower price. Most residential consumers do not spend as much as $6 a month for gas service. If a monthly outlay of $6 is above the budgetary limit of an ordinary family's expenditures for gas, then the block schedule of prices means nothing to most buyers. The price schedule does not promote an enlargement of consumption.* Given such a price schedule, most buyers really pay a uniform price for each thousand cubic feet of gas; their purchases are confined to the first block.

Just as different choices of block sizes and block prices are possible, so are different choices of promotional block schedules. Many choices of block sizes and prices expand the consumption beyond the purchases with uniform prices. An enlargement of consumption, however, is only one characteristic of promotional price schedules. Another dimension is the amount of earnings that either are desired by the company or are allowed by the commission. Different price schedules obviously have different earnings effects; and the same price schedule has different earnings effects for different companies.[*] If earnings are not a dimension of promotional prices, then the largest amount of consumption can be realized with free service. But the earnings dimension cannot be ignored. When companies and commissions take account of earnings, a promotional block schedule can be defined as the choice of block sizes and block prices that produces the largest possible consumption for a given amount of earnings. If the residential service earnings of an electric company, for instance, are fixed at $1,000,000 a year, a promotional block schedule maximizes the domestic consumption for $1,000,000 worth of earnings.[†]

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* The Wisconsin Commission says that an initial block of 5,000 cubic feet is too large to promote an enlargement of residential gas consumption.[5]

Even if the regulators and company managers agree that a promotional block schedule has both output and earnings dimensions, different measures of the best promotional schedule still are possible. Companies and commissions usually do not agree exactly on earnings and price policies. Having different views of the reasonable earnings, the private companies and commissions are likely to have dissimilar views of the best promotional schedule of prices. If a reasonable amount of earnings is fixed by a commission, one block schedule is chosen so that the service output is maximized. But, if the firm is free (as it was in many states before 1930 and still is in some states) to seek the maximum possible enlargement of earnings, then another block schedule is chosen. Indeed, the companies originally developed block schedules because they were interested primarily in earnings increments rather than output increments. For companies the earnings dimension of promotional pricing is paramount; the output dimension is secondary.[‡]

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[*] For this reason a single block schedule of prices cannot be the best promotional schedule for all companies, even if it is best for some companies. Yet "national" price schedules for utility service are proposed. Bauer and Gold (quoted by permission of Harper & Brothers from *The Electric Power Industry,* p. 96) say, for instance, that the following residential block schedule is "really promotional" and is "readily attainable in most communities":[6]

First 40 kw.-hrs. each month	5.0¢ a kw.-hr.
Next 60 kw.-hrs. each month	4.0¢ a kw.-hr.
Next 300 kw.-hrs. each month	1.5¢ a kw.-hr.
Over 400 kw.-hrs. each month	0.5¢ a kw.-hr.

They are thinking apparently of a promotional block schedule which has only one dimension: a large service consumption by most families. And any consideration of the earnings dimension seems to be neglected.

[†] For any single class of buyers this definition assumes, of course, that the earnings of the company are divisible according to customer classes.

[‡] Administrative judgments of demand behavior are other reasons for the variations in block schedules. A promotional block schedule, as described in the next chapter, is necessarily related to the buyer's demands. But demand curves and future changes in demand curves are not fully known. Lacking exact demand information, each price fixer can have his own output-maximizing schedule.

Wright Demand Rate. An ordinary block rate does not distinguish between the buyers according to their maximum demands for service. To correct this condition, the Wright demand rate, proposed before 1900 by an Englishman who found a relationship between the maximum demands of individual buyers and the overhead costs, was used frequently for residential electric service a few decades ago.[7] This rate form appeared customarily as a one-part rate which had a descending scale of prices. An example of a Wright demand rate is:

First	30 hours of use of active demand each mo.	7¢ a kw.-hr.
Next	30 hours of use of active demand each mo.	5¢ a kw.-hr.
Next	60 hours of use of active demand each mo.	4¢ a kw.-hr.
Over	120 hours of use of active demand each mo.	3¢ a kw.-hr.

This price form is not understandable unless the meaning of "active demand" is clarified. The active demand of each buyer can be measured, as it usually is for industrial customers, with a mechanical demand meter. Using a meter, a company can define the active demand as the fifteen-minute or thirty-minute period of consumption in each month. But meter measurements of active demand were expensive and troublesome for many residential consumers—the customers for whom the Wright demand rate was designed. Consequently the companies usually measured what was called the "connected load" of each buyer. This was the rated capacity of his fixtures and appliances. For electric service the wattage of installed light bulbs and the rated electricity capacity of appliances were added together to determine the connected load of a customer. In actual practice, however, the companies did not follow exactly the same methods when they computed the consumption capacity of each buyer. Some of them made a complete count of a consumer's service capacity; others counted only part of the connected appliances and sockets.

To illustrate the computation of a Wright demand bill, let us suppose that the active demand of a buyer is 1,500 watts or 1½ kilowatts. Using the above rate schedule, this buyer multiplies 1½ kilowatts by 30 "hours of use" to determine how many kilowatt-hours he must buy at 7 cents a unit before he can buy electricity at 5 cents a kilowatt-hour. The answer: he buys 45 kilowatt-hours at 7 cents a unit. He has a separate block schedule which is based on his active demand for service:

First	45 kw.-hrs. each month	7¢ a kw.-hr.
Next	45 kw.-hrs. each month	5¢ a kw.-hr.
Next	90 kw.-hrs. each month	4¢ a kw.-hr.
Over	180 kw.-hrs. each month	3¢ a kw.-hr.

Since the active demand, measured either with demand meters or by the wattage of appliances, is not uniform for all consumers, each buyer has his own distinctive block schedule. Price differentiation is based on the active buyer demands as well as increments in buyer consumption. If a buyer has a high active demand for service, he must buy more service units at each block price than the buyers with lower active demands are required to buy.

Never a popular form of residential pricing, the Wright demand rate was used less and less frequently after 1920. The electric companies, which used the Wright form more than the gas companies did, had many troubles with the measurements of active demands. Starting from scratch, they had to devise a workable definition of active demand. As they made actual measurements of the active demands, company representatives usually entered homes and made direct studies of the available appliances and the service consumption. But no measure of the buyers' active demands was permanent. After the first investigation was completed, frequent checks had to be made so that changes in these demands were accounted for. If all appliances, moreover, were counted as soon as they were bought, the Wright rate form discouraged appliance purchases and enlargements of output. Compensating for this unpromotional characteristic of the rate, companies often omitted some appliances from the connected load counts or included only part of the rated capacities of some appliances.

Buyers did not like the Wright demand rate. They were confused by the computations. The measurements of active demand looked, indeed, like twisted arithmetic to them. These computations were irregular, too, because some buyers concealed the ownership of appliances, or put small bulbs in sockets just before the company representatives made their investigations. More important, consumers either did not understand or did not accept the demand principle of pricing. The ordinary buyer did not know why he should buy more service at each block price just because he had more bulbs or appliances than his neighbor. The company's explanation of readiness-to-serve costs was not convincing to many consumers; it seemed to be a trick with which the company obtained more profits from utility service.

Room or Area Rates. A room rate is a substitute for the complicated Wright rate. The number of rooms or the square feet of living space can be used to measure the "demand" of residential buyers. An illustration of a room rate is:

First	5 kw.-hrs. for each active room each mo.	7¢ a kw.-hr.
Next	5 kw.-hrs. for each active room each mo.	5¢ a kw.-hr.
Next	10 kw.-hrs. for each active room each mo.	4¢ a kw.-hr.
Over	20 kw.-hrs. for each active room each mo.	3¢ a kw.-hr.

Measuring the active rooms of a home, the company counts all rooms in a house, exclusive of closets, the basement, the attic, or other small or infrequently used rooms. A minimum number of active rooms for each customer usually is specified. If a buyer has five active rooms, his rate schedule is:

First 25 kw.-hrs. each month	7¢ a kw.-hr.
Next 25 kw.-hrs. each month	5¢ a kw.-hr.
Next 50 kw.-hrs. each month	4¢ a kw.-hr.
Over 100 kw.-hrs. each month	3¢ a kw.-hr.

If the rate form is based on the area rather than the number of rooms of a home, the general schedule is expressed in square feet of floor space rather than the active rooms. Like the room rate, the area rate for each buyer takes a block schedule form after the block sizes are determined by a floor-space count.

Some companies have used a two-part room rate for residential service. A "demand" charge, based on the number of rooms, is listed separately from the energy charge. An example of this rate form for residential service is:

Demand Charge
80¢ each month for the first two rooms or less
20¢ each month for each additional room

Energy Charge

First 30 kw.-hrs. each month	4¢ a kw.-hr.
Next 70 kw.-hrs. each month	3¢ a kw.-hr.
Over 100 kw.-hrs. each month	2¢ a kw.-hr.

Compared with the connected-load type of Wright rate, a room or area rate has a readiness-to-serve charge that can be readily determined. The number of active rooms or square feet of floor space are easily measured; the customers cannot conceal rooms and floor space. But this price schedule is not a popular form of pricing. A company clearly fixes prices in an arbitrary manner when it chooses floor space or rooms as a basis for demand-cost or capacity-cost allocations among the individual buyers. The "responsibility" of buyers for plant capacity is not necessarily related to the sizes of their homes. Certainly the customers who live in large, old houses do not think so. Just as buyers do not understand the connected-load differentiation of prices, so they are unable to understand why the charge for electricity should be differentiated according to the sizes of their homes. Although commissions often are willing to approve demand charges for residential consumers,[8] some of them disapprove or order discontinuance of room and area rate forms.[9] Facing the general opposition of buyers and the occasional opposition of commissions, many electric and gas companies abandoned the room or area type of rate. They turned back to block-price schedules, either plain block rates or those that are combined with service charges or minimum bills.

The Service Charge. Utility-company managers, supported usually by the commissions, often object to one-part rates for residential and small commercial customers. They have one important objection: a plain block schedule does not charge enough to the customer who buys a few units of service. Too little is paid for electric and gas service by the "convenience" user, the buyer who consumes service irregularly. A small buyer of gas or electric service is not necessarily a person with a low income. A small gas consumer may be a person who eats most of his meals away from home. And many small buyers of electricity or gas are apartment dwellers, physicians and other professional men, small storekeepers, and infrequently used clubs.[10]

Unless the first block price covers nearly all the customer and capacity costs, a small buyer does not pay the full costs of his service. He does not pay the costs that the companies and their rate engineers believe are those of his purchases. According to managerial estimates, as many as 30 or 40 per cent of the small gas consumers throughout the country and more than 50 per cent of those in some cities pay less than the costs of their services.[11] And one writer estimates that, under an ordinary block schedule, the buyers of less than 20 kilowatt-hours of electricity each month do not pay their own way.[12]

Service charges are used to correct the disparity between the costs and the revenue of small-buyer service. The service charge is a fixed, flat charge which every buyer pays in addition to his energy charges. This charge ordinarily is $1 to $1.50 a month for each residential buyer of electricity or gas. When a connected consumer buys no service or only a small quantity during a month, he pays the same service charge as the buyer of 500 or 1,000 units of service; and the charge is paid until the service is disconnected. As one writer describes it, the charge is based "on the sheer fact . . . [the buyer] is a potential customer, attached to the system, and capable of being served." [13] The service charge usually covers the customer costs, or slightly more than these costs. It covers the costs of meter reading and collecting accounts that tend to vary with the number of customers.[14] In addition some companies, which have service charges above a dollar a month, include some of the readiness-to-serve costs.

A service charge can improve the promotional character of a block rate schedule. Since some fixed costs of operation are included in the charge, the block scale of prices starts at a lower point and can descend more rapidly than it otherwise does. But as anyone can readily imagine, the service charge is not so attractive to the buyers as to the sellers. To the companies it is one feature of what they like to call "scientific" pricing. Buyers, on the other hand, do not understand why they should pay a charge just because they have a right to buy service. Since consumers pay for nonutility commodities only when they actually buy the commodities, they believe that the utility companies should have the same pricing policy. A department store owner and other storekeepers do not collect admission charges from potential customers. Accustomed to charges for what they actually buy rather than what they can buy, utility consumers do not like service charges. Yet, despite the objections of buyers, commissions allow service charges of a dollar or slightly more.[15] In New York, however, a statute prohibits the use of service charges.[16]

Two alternatives for the service charge are widely used. One alternative is the minimum bill. The rate form appears, let us suppose, in the plain block form. Trying to get more revenue from small buyers, the company fixes a minimum bill of 75 cents or $1 a month for residential gas or electric service.* If, according to the prevailing rate schedule, the consumer's bill equals or exceeds the minimum bill, the buyer is unaffected by the minimum-bill provision; if his computed bill is below the minimum bill, he pays the minimum bill rather than the computed bill. Consumers usually are more satisfied with a minimum bill than with service charges, though the buyer who temporarily stops or greatly reduces his purchases still is irritated. On the managerial side of pricing practices, however, the minimum bill generally is considered less promotional than the service charge, because more fixed costs must be recovered from the first blocks of service.[17]

Another alternative is the initial bill. This is an example of an initial bill:

First	10 kw.-hrs. or less each month	$1.25
Next	20 kw.-hrs. each month	6¢ a kw.-hr.
Next	70 kw.-hrs. each month	5¢ a kw.-hr.
Over	100 kw.-hrs. each month	4¢ a kw.-hr.

For the first 10 kilowatt-hours the buyer pays a flat charge of $1.25; thereafter he pays a kilowatt-hour price for additional service. When a buyer purchases 30 kilowatt-hours, he pays $1.25 for the first 10 kilowatt hours and $1.20 for the next 20 kilowatt-hours; he pays a total bill of $2.45. The initial bill is included in every consumer's bill, whereas the identity of a minimum bill is lost after consumption passes a certain point. Fixing such a flat charge for the first service units, a company reduces the amount of fixed costs that are assessed to the subsequent service units; consequently the initial bill generally is believed to be more promotional than a minimum bill. It is a compromise between the service charge and the minimum bill.

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* There are larger minimum bills, of course, for such kinds of service as large power consumption or house-heating use of gas.

Industrial Rates. Large commercial and industrial buyers of gas and electricity have the most complicated forms of price differentiation.[18] One reason for the high degree of price differentiation is obvious: complex price schedules are more understandable to large consumers than to small residential and commercial buyers. And the companies have more at stake in the pricing of industrial service. The industrial bills are large relative to residential bills; the companies can afford to study and administer a high order of price differentiation. When they choose industrial service rates, the companies give particular attention to a separate demand charge. A two-part rate of the Hopkinson type, which originally was developed in England around 1900, is a common form of industrial rate schedules. An example of this type of rate schedule is:

Demand Charge

First 25 kw. of maximum demand each month	$3.00 a kw.
Next 75 kw. of maximum demand each month	2.00 a kw.
Next 400 kw. of maximum demand each month	1.50 a kw.
Over 500 kw. of maximum demand each month	1.25 a kw.

Energy Charge

First 2,000 kw.-hrs. each month	3.0¢ a kw.-hr.
Next 8,000 kw.-hrs. each month	2.5¢ a kw.-hr.
Next 30,000 kw.-hrs. each month	2.0¢ a kw.-hr.
Next 60,000 kw.-hrs. each month	1.5¢ a kw.-hr.
Next 400,000 kw.-hrs. each month	1.0¢ a kw.-hr.
Over 500,000 kw.-hrs. each month	0.7¢ a kw.-hr.

The average consumption during the maximum fifteen- or thirty-minute period, measured with a meter, commonly is the monthly maximum demand of an industrial buyer.[19]

The energy and demand prices of a two-part schedule vary according to the kind of service performed. One set of prices applies to the regular service, the service that the company sells at any time. When off-peak or partly off-peak service is sold, another price schedule is used. The block sizes and block prices, furthermore, are not alike for all companies. Some companies, for instance, have a uniform price for each kilowatt of electricity demand; and other companies use block demand prices. Finally, some companies add a service charge, making a three-part rate.

The prices for industrial buyers and other large consumers of gas often take the complicated two-part and demand-charge form, though separate demand charges are less common in the gas than in the electric industry. Unlike electricity, gas can be stored from day to day. Consequently two kinds of maximum demands generally are recognized for gas service: the largest daily consumption during a year, and the largest hourly consumption during a day. If demand charges are made for industrial gas service, they ordinarily are based on the hourly maximum demands of the consumers. They may be uniform prices for each unit of maximum demand—e.g., 5 cents a cubic foot of the maximum hourly demand of each month. Or they may be blocked in the following manner:

First 500 c.f. of maximum hourly demand each mo.	6¢ a c.f.
Next 1,500 c.f. of maximum hourly demand each mo.	4¢ a c.f.
Over 2,000 c.f. of maximum hourly demand each mo.	3¢ a c.f.

Like electricity schedules, the energy price schedule for industrial gas service usually contains a number of blocks and a descending scale of prices.

There are further complexities of industrial rate schedules. Electric and gas-manufacturing companies frequently attach fuel clauses to their industrial schedules. The fuel clauses are used in this way: when the ton price of coal increases a certain amount above or decreases a certain amount below a specified (base) price, the unit charges for electricity or gas are increased or decreased. Natural gas companies sometimes provide for gas price adjustments when the price of fuel oil increases or decreases a certain amount a gallon or barrel. Thus a competitive price relation is maintained between fuel oil sales and natural gas service. Some electric and gas companies give discounts to industrial customers or large commercial buyers who improve their load factors and consume more off-peak service. Other discounts, too, are given to industrial buyers of electricity who own transformers or who purchase electricity at the supply-line voltage. And some electric rate schedules contain special provisions for power factor penalties or bonuses.[20] The special provisions of industrial price schedules (e.g., power-factor adjustments) show distinctly the influence of the engineer in the formulation of pricing practices. Because engineers influence the shape of these schedules, only an engineer, indeed, can interpret and apply their technical provisions.

Therm Rates. A special form of gas prices, the therm rate, was introduced during the thirties. This was done when a number of companies changed from manufactured gas to natural gas service. It is really a special method of billing rather than a form of pricing. Gas consumption of buyers is metered in cubic feet; then the cubic feet are translated into therms. The company tests the B.t.u. content of the natural gas, and computes the average heat content of a cubic foot; this average is multiplied by the cubic feet of a buyer's consumption to determine the total B.t.u. consumption; then the total B.t.u. are translated into therms, each of which is usually defined as 100,000 B.t.u. Consumption is measured in cubic feet and the price is quoted in heat units.

The companies substitute the therm unit for the cubic foot unit of service so that they can avoid a loss of revenue. After the higher hydrocarbon content is extracted from natural gas and the remaining gas is high in methane content, a cubic foot of natural gas contains roughly twice as many B.t.u. as a cubic foot of ordinary manufactured gas. Stripped of its higher hydrocarbon content, natural gas has about a 1,000 B.t.u. in a cubic foot, whereas manufactured gas usually has from 500 to 600 B.t.u. A buyer can do approximately the same amount of heating with a cubic foot of natural gas as with two cubic feet of manufactured gas. If the companies do not change their rate schedules when natural gas is substituted for manufactured gas, their revenues decline because the buyers purchase fewer cubic feet of gas. The gas companies can increase the cubic-foot prices, and thereby prevent a decline in the gross revenue and the net revenue. But consumers protest vigorously against increases in cubic-foot prices, particularly if they are told that natural gas service is expected to be cheaper than manufactured gas service. Consequently the companies, shifting from a cubic-foot to a heat-unit basis of pricing, cover up a price change.

WATER RATES

Water companies, like electric and gas firms, have large investments in their plants and equipment. But they practice far less price differentiation than is done by the electric and gas companies. Water prices generally are simple and do not reflect much managerial anxiety about buyer differentiation according to demand costs and customer costs. Moreover, water consumers are billed quarterly, semiannually, or even, in a few instances, for an entire year, while monthly bills are common for gas, electric, and telephone service.

The flat rate still is a fairly common price form for water service. Such a charge usually takes the form of a flat fixture charge, or a related series of flat fixture charges. A flat price may be charged each billing period for the first faucet or first pair of faucets; and, as the number of faucets increases, the flat charges for each faucet decrease. Flat charges for bath tubs or laundry tubs generally are lower than the charges for the first faucet or first sink; and, like the charges for each faucet, the flat charges decrease as the number of tubs increases.

Meter rates are more common, however, than flat rates among water prices. Meter rates economize the use of water plants. Metered service reduces water pumpage,[21] eliminating wastage and limiting the water-system investments as a city grows. Sometimes the meter rates are uniform or straight-line rates—the same price for each hundred or thousand gallons of water even if the consumption varies widely between small and large consumers. Other meter rates, of course, are the block type. But the companies sometimes have such large-sized blocks in the schedules that they clearly show a disinterest in promotional pricing. In some instances there are either service charges, minimum bills, or initial bills. But complex demand rates, which electric and gas companies use for industrial and other large buyer service, are uncommon among water companies.

The predominance of municipal water systems is one explanation of the limited price differentiation between water buyers. Municipal governments do not have the same interest in more earnings that private firms do. Lacking the acquisitiveness of private companies, they are not anxious to develop a highly differentiated pattern of pricing. Performance of water service is the important municipal purpose of plant operation. A municipal government wants to provide healthful water service and fire protection; and the choice of price forms is a secondary consideration. Municipal officers even seem to be willing to continue the use of wasteful flat prices as long as enough plant capacity is available for both necessary and unnecessary water service. There is a further reason for the simplicity of water prices. Unlike the gas and electric companies, the private and public producers of water service are confined largely to old uses and old markets for water. The common conditions for differentiated and promotional pricing are missing: the water systems have no new kinds of consumption to promote, or they cannot readily segregate the new from the old water uses.

The charge for fire-protection service is a special case of price determination. Fire-protection service usually is priced according to plant capacity costs—the readiness-to-serve costs that are incurred to hold some plant capacity available for fire protection. But some public water systems either are not reimbursed at all or are only partially reimbursed by the city for the fire-protection costs. In these instances the costs of fire protection are shifted to the regular water consumers. When a municipal plant performs water service, the charges for fire protection depend on municipal finances and what is considered a politically expedient policy. In many towns, in fact, the water-system accounts and funds are lumped with the general municipal accounts and funds. When the water-system finances and accounts are not set apart, the city government is likely to disregard the total public cost of fire protection. A private water company, on the other hand, usually wants a payment for this public service. Yet political considerations often limit the private company charges for the service. When either a public or private water system does make charges for fire-protection service, the price commonly is quoted as an annual charge per hydrant. Among private companies the charges commonly are between $25 and $100 a hydrant each year.[22]

TELEPHONE RATES

Being aggressive and notably dominant in the telephone industry, the Bell system of companies is able to develop differentiated price schedules for different kinds of telephone service. But they maintain, instead, a relatively simple pattern of pricing, though some price differentiation is used.[23] A major distinction in rate forms exists between local, long-distance, and special services. Telephone-rate forms vary, too, according to the different kinds of local service and according to the sizes of towns.

Local Telephone Service. Much local telephone service is sold at flat rates. In a village a telephone company often sells unlimited, single-party service at a flat monthly price to all residential buyers. Likewise, the commercial subscribers in villages pay flat prices for unlimited service, though their flat prices usually are higher than the residential charges. In the larger towns the flat-price differentiation is based on the number of subscribers for each line. An example of this price differentiation is:

One-party service	$4 each mo. for each buyer
Two-party service	3 each mo. for each buyer
Four-party service	2 each mo. for each buyer

Even in the largest cities, where much of the telephone service is metered, a buyer can have unlimited service at a flat price. But he pays a higher flat price each month than is paid by other kinds of subscribers.

Although flat rates for unlimited telephone service do not economize the use of telephone plant,[24] there are some evident reasons for their wide use. They are easily administered, and they save the expense of metering telephone calls. Trying to maintain good customer relations, the telephone companies keep the flat rates because they please the subscribers. The subscribers like the simplicity of the flat prices. And telephone companies apparently do not want to eliminate flat charges as long as sufficient plant capacity is available for the present service, and as long as their earnings are adequate. Since their plants are built to provide unlimited telephone service in many localities, the companies can gain little or nothing if flat prices are eliminated. They can increase the amount of unused plant, but they cannot effect large cost economies. Costs of handling calls can be reduced, but the costs of metering are added. If the company obtains satisfactory earnings with flat prices, it may be content to leave the prices alone. And the demand for metered and limited service is not clearly known to every company, though experiences elsewhere do give a company a factual basis for demand estimates. Thus, when telephone companies have adequate plants, receive satisfactory earnings, and are traditionally bound to flat rates, they keep flat rates in villages and small cities.

On the other hand, as the population of the large cities grew, the telephone companies were forced to make new investments in their plants. Pressed to provide adequate plant capacity for all subscribers, the companies in the large cities wished to economize the available plant capacity. Substitution of limited service for unlimited service was one way to spread the use of telephone plants among more subscribers. Consequently metered service became common in the cities. For residential customers a familiar price form, which is differentiated according to the subscribers for each telephone line, is the initial bill. A flat charge is made each month for a limited number of calls. When a subscriber's calls exceed the maximum number for which he pays a flat charge, he buys each additional call at a uniform price. For many subscribers, who seldom use more than the initial amount of calls, the initial bill is still a flat charge for the month. Examples of initial bills for two-party service are:*

35 calls or less, each month	$2.25, each extra call 4¢
65 calls or less, each month	2.60, each extra call 4¢
90 calls or less, each month	3.40, each extra call 4¢

Business subscribers also can choose between rates that are differentiated according to different initial numbers of calls, though their initial bills usually are higher than those for residential service.

A uniform price, traditionally 5 cents a call, is charged for coin-box service in public booths that are located in stores, hotels, and other public places. Small business firms sometimes subscribe to a semipublic, coin-box service. Users of the semipublic service pay a uniform price for each call (usually 5 cents a call), and the subscriber to semipublic service pays a minimum bill of, say, 25 cents a day. When private-branch exchanges are provided for hotels, large companies, and office buildings, telephone companies charge 3 or 4 cents for each outgoing call; and the subscriber to private exchange service sometimes pays a fixed monthly charge that is based on the capacity and type of the private switchboard.

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* The initial bills for limited service are differentiated, of course, according to single-party, two-party, and four-party lines. A limit of four parties to a line usually is fixed, however, for urban telephone service.

Telephone companies do not use the block form of pricing, the common pricing form for electric and gas service. They do not use quantity discount prices, and try to promote enlargements of telephone service. Company managers prefer simple prices for telephone service. These managers apparently believe that the dèmand for telephone service is inelastic. Taking this view, they expect decrements in total revenue when subscribers are given opportunities to purchase successive blocks of calls at a descending scale of prices. If the managers of telephone companies are right about the inelastic demand for their service, a change from an initial-bill to a block form of pricing reduces the earnings of the companies. Nor do the companies find many new uses for local telephone service. Talking to friends, calling stores, transacting business matters—these and other common communication uses of local telephone service are as old as the telephone industry. Unlike the electric companies which experience successive increases in demand as new residential appliances and new industrial power uses for electricity are developed, the telephone systems have no important new service uses to promote. And the companies must reckon, morover, with the fact that they can experience increasing rather than decreasing average costs of production as output expands.

The telephone companies use a simple output unit, the call. They do not want to price the local telephone service according to the holding time of calls. A mechanical contrivance, the telechronometer, is available to record the holding time of telephone calls.[25] If holding time is the basis of telephone pricing, the companies can economize the use of their plants. And when multiple-party service is sold, this is a way to reduce the service delays which the consumers experience. But the Bell companies do not accept this basis of pricing.* Trying to preserve their excellent public relations, the Bell companies naturally put off important price revisions for a long time. Thèy want contented customers. And the system can incur revenue reductions when they shift from a call unit to a holding-time unit of service. Receiving "enough" earnings to maintain their dividends and financial standings, they are not interested in new price policies and unpleasant subscriber reactions. At any rate, as long as plant capacity is not very scarce and telephone earnings are excellent, the companies are not likely to give up the call unit of local telephone service.

Additional Charges. Telephone companies usually make flat charges for telephone installations and for other wiring jobs. When the subscriber wants supplementary equipment such as an extension bell, buzzer circuit, or longer desk cord, a company collects both an installation charge and a flat monthly rental for the equipment. The installation and rental charges on handsets, however, were eventually erased by the commissions.[27] Handsets were used in Europe for many years before the Bell system began to manufacture and install them in this country. When the Bell companies finally began to install many of them after 1927, a common rental charge for handsets was 50 cents a month for each instrument. And the installation charge ranged from $1 to $3. Trying to justify these charges with cost studies, the Bell companies listed the research costs on handsets, a high annual rate of depreciation of handset investments, extra repairs, added taxes, administrative expenses, and uncollectible bills. Some of the commissions investigated these costs and ordered rental reductions;[28] and, meanwhile, the Bell companies made voluntary rental reductions in some states. By the end of the thirties the state commissions began to look on the handsets as regular subscriber equipment and to order the elimination of the rental charges.[29]

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* A few telephone companies put a time limit on local calls. After five to eight minutes elapse, the parties are automatically cut off.[26]

Toll Rates. Charges for toll telephone service vary according to the time, distance, and holding time of the calls.[30] The costs and the consequent scarcity of toll circuits explain why toll charges are differentiated according to the kind, distance, and holding time of the calls. As the distance of the toll call increases and as the terminal costs, which are considered fixed costs of the toll business, become relatively less important in the total cost of any call, the toll charge increases at a decreasing rate of increase. The area around a single exchange and for the whole country is divided into zones and blocks; these zones and blocks are used to figure the increments in toll charges. When the toll-call distance, measured by air-line distance, is between 40 and 350 miles, the toll charge increases by 7-mile blocks; beyond 350 miles the toll charge increases every 35 miles. But the differentials between person-to-person and station-to-station rates decline as the length of the call increases, because the economies of station-to-station operation decline as the toll-call distance increases.[31]

While local telephone service is sold in call units, a toll service charge varies with the holding time of the call.* And a minimum charge is fixed, too, for each toll call. The time limit for the initial or minimum-charge period is usually five minutes for short-distance calls, and three minutes for long-distance calls. Selection of an initial time period of three or five minutes is, to be sure, a somewhat arbitrary choice. But some choice was necessary as the toll service developed. Apparently the three- and five-minute choices were convenient and produced satisfactory earnings for AT&T. Since the toll-service plant is adapted today to these choices of initial time periods, AT&T cannot afford to change the time periods unless toll rates are increased. If the Bell system reduces the length of the time periods, new investments in long-distance circuits may be necessary. Overtime charges usually are proportionate to the initial charge, and are computed for each additional minute of holding time. The absence of quantity discounts as holding time increases apparently can be explained, like other features of toll pricing, by a managerial desire to economize the use of existing plant and to limit further investments in long-distance equipment.

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* Toll-call prices are differentiated, too, according to the time when the calls are made. Toll rates are lower on Sunday and between 6 P.M. and 4:30 A.M. on weekdays than at other times. When long-distance calls are made, the night and Sunday calls are about 40 per cent cheaper than the regular calls. But these off-peak reductions are not given on short toll calls.

URBAN TRANSPORTATION RATES

Within a single city a uniform price for each ride is the typical and nearly universal price form for bus and street railway service. Some companies charge a price for transfers; other companies do not. If a charge is made, it is customarily 1 cent for each transfer. The uniform price for rides is not chosen by the street railway and bus companies because they believe that total transportation costs vary largely with the number of riders. Like other kinds of utility companies, urban transportation systems, too, have plant-capacity costs. And the costs of service bear a relation to the length of the rides. More costs are incurred to carry riders to the outlying parts of a city than to carry them short distances. But price differentiation in the urban transportation industry is difficult, though American bus and street railway companies often try to effect some price differentiation.

A further fact about the uniform price for each ride should be mentioned. The money unit often limits the choice of the uniform price. Single fares must be expressed in 1-cent units; a single fare must be, for example, either 5 or 6 cents, even if 5½ cents seems to be the best choice according to reasonable earnings measurements. Buyers sometimes are determined, furthermore, to keep a conventional price for a ride, even if the financial standing of the company is impaired. At the time of the First World War the 5-cent fare was nearly universal. Riders believed that this was the "right" rate. So, between 1915 and 1920 the transportation companies were hard pressed to break the tradition of a 5-cent fare. Now another generation of riders in many cities believes that a 10-cent fare is the maximum reasonable price for a ride.

After the First World War ended and after automobile transportation began to take the place of much bus and street railway service, transportation companies increased their interest in differential pricing.[82]

The companies frequently sell bunches of tickets or tokens at moderate discounts. If the single fare price is 10 cents, a company offers twelve tokens or tickets, which are usable at any time, for $1. Thus the convenience rider, the rider who uses the public means of transportation irregularly and on bad-weather days, pays a higher price for a ride than the regular rider. But when the company wants to increase its revenue and earnings with this kind of price differentiation, it must choose the quantity discounts carefully. The number of riders, including the number of regular riders, increases after the quantity discounts are offered. That is the purpose of the price differentiation. Some discounts provide larger revenue and earnings increments (or decrements), however, than are afforded by other discounts. A large discount, such as twenty tokens for a dollar when a company has a 10-cent fare, is sure to increase the number of riders. But it also is likely to reduce the total revenue and earnings of the company. Contrasted with other utility firms, the transportation companies cannot withhold discounts from the old, regular buyers. Since these buyers can purchase twenty tokens for a dollar and get 5-cent rides instead of 10-cent rides, a firm may lose total revenue and earnings with the price differentiation. Consequently it wants a revenue increment from new riders that exceeds the revenue decrement from old riders as well as the cost increment.

Several other kinds of price differentiation of urban transportation service are possible.[38] One of these is the weekly pass. A person pays a flat price of, say, a dollar for a pass that permits him (usually the pass is nontransferable) to ride as often as he pleases for a single week. A similar form of pricing is known as the "nickel permit." If a company, whose single-ride fare is 10 cents, sells permits for 50 cents, the holder of a permit can ride as often as he wishes during a week when he pays 5 cents a ride. Or the companies can sell weekly punch cards: a rider pays a dollar for a card that allows twelve rides a week and, if he rides more than twelve times during this time, he pays 5 cents for each additional ride. But none of these forms of price differentiation are widely used. A uniform, single-ride fare still is the common price of urban transportation service.

Bus and street railway companies can differentiate fares according to routes, charging the highest fares on the lightly traveled or long routes and charging the lowest fares on heavily traveled or short routes. This kind of price differentiation usually is confined to short routes or to special services. Some companies, for example, offer low-price rides within the main business area of a city. If the regular fare is 10 cents, a special fare of 5 cents (without transfer privileges) is charged for this limited service. Or a special rate is fixed for fast, nonstop service between certain points.

The length of the ride is another basis for price differentiation. In a metropolis, where a uniform single fare is charged irrespective of the length of the ride, a person can ride as far as twenty or more miles as cheaply as he can ride a few blocks. The long rider is charged less than the average cost of long rides, while the short rider pays more than the average cost of short rides. A zone form of pricing adjusts the fare more closely to the distance and average cost of rides. A transportation company can divide the city into zones, charging additional prices as the riders are carried from one zone to another. This differentiation of transportation prices bears a relation to the incremental costs that are incurred as the limits of transportation service are extended. Zone prices for urban transportation service are common in European countries. But American companies avoid the use of zone pricing, fearing apparently the administrative problems of this kind of price differentiation. An additional charge often is made for rides beyond an American city's limits; but zone price differentiation, except for occasional experiences, still is untried in America.

Chapter 28

More Discriminatory Pricing

PRICE DIFFERENTIATION, not only between buyer classifications but also between buyers within a service classification, is the most notable characteristic of public utility rates. Within a service classification the price differentiation is particularly evident in the price schedules for electric and gas service. Unlike telephone and transit companies, electric and gas firms commonly differentiate their rates according to the amount of each buyer's consumption. The small domestic or commercial buyer pays the highest average price for service; in addition he often pays a service charge or is obligated to pay a minimum monthly bill. But the large residential or commercial consumer can take advantage of the quantity discounts that are available in the common block form of price schedules. Similarly, the small industrial buyer of electricity, gas, or water often pays a higher average price than the large industrial buyer, even though both of them are in the same service classification. The large customer is favored. The residential consumer who has a large income and can buy expensive gas and electric appliances, the commercial buyer who has a large store, the industrial buyer who has a large manufacturing plant—these customers buy the utility services at the lowest average prices.

The predominance of price differentiation is obvious. But is it a discriminatory or a nondiscriminatory differentiation? Do differences in service costs or in buyer demands determine the differentials within the price schedules? The companies, whose reasoning about price policies commonly is accepted by the commissions, argue that costs of service determine the shape of the price schedules. Some costs, they say, are functions of the number of customers; these costs are the basis for service charges, minimum bills, or high initial block prices. Other costs of individual-buyer service, costs which are inferred from the general cost behavior of the companies, are treated as functions of the demands for services; they, too, are used to explain either high initial block prices or readiness-to-serve charges. Thus higher average costs of service are computed for the small customers than for the large buyers. But these inferences about cost behavior do not dispel suspicions about discriminatory price differentiation. Some costs, such as the readiness-to-serve costs, are allocated according to differences in individual buyers' demands. These cost allocations do not prove that prices are nondiscriminatory. The companies openly use differences in buyers' demands to allocate a large part of the service costs; yet they claim that they do not practice discriminatory pricing. Do the managers and rate engineers of utility companies know that discriminatory prices are based on differences in consumer demands? Do these men know that they are reasoning in a circle about the relationship of prices and costs? They use demand differences of buyers to make arbitrary allocations of joint production costs; then they use the computed costs of service to prove that the demand behavior is not the basis of price differentiation. And when promotional price schedules are set up, the companies unquestionably are guided by demand behavior as they choose the price differentials. Since promotional price schedules are designed to expand or even to maximize the consumption for a given amount of earnings, they must have some connection with the demand curves of the consumer classes.

There are several kinds or degrees of price discrimination. One kind, which differentiates between buyer classes according to demand elasticities, is described in a previous chapter. This is called "class pricing." It is called "third-degree discrimination" by Pigou.[1] In Pigou's classification the first or "ideal" degree of price discrimination power is characterized by a different price for every output unit. This is a rare form of price discrimination. But second-degree discrimination is more common. This kind is distinguished by a series of prices: all output units, which have a demand price of x or more than x, are sold for an x price, all units with a demand price below x and above y are sold for a y price, and so on. The second-degree discrimination resembles the block form of utility pricing. It is the kind of price discrimination that is discussed in this chapter.

DEMAND-PRICE DIFFERENTIATION

Electric and gas companies again provide the best examples of price discrimination. A descending scale of prices, as buyers' purchases increase, is a common characteristic of their price schedules. The block principle of price scheduling is widely used. Sometimes, as in the case of simple rate schedules for small buyers, a block schedule alone is used. At other times two-part or even three-part schedules are employed. And when electric and gas companies use complex two-part and three-part rate forms, one or more parts of the rate schedules are arranged in the block form. In some industrial rate schedules both the energy charges and readiness-to-serve charges are blocked.

The General Pattern. A block schedule of prices is chosen by the company or the commission from the buyers' demand prices. Such a schedule is based on an estimated demand curve for the buyers who use the schedules; it is based on the series of prices at which these consumers, taken together, are willing to buy various quantities of utility service. This relation of the buyer-class demand to the block-price schedule is illustrated in Figure 19. Given the demand curve *D*, a company can sell no larger quantity than OQ_1 at the price P_1, the highest demand price for this quantity. If P_2 is the next and lower block price that is chosen from the demand prices, a quantity Q_1Q_2 can be sold. The quantity Q_2Q_3 can be sold at the demand price P_3, and the quantity Q_3Q_4 can be sold at the price P_4. The marginal outlay rather than the average outlay of the buyer class guides the seller who uses this sort of pricing.[2] For instance, P_2 is the price for quantity Q_1Q_2, not the larger quantity OQ_2. Retaining the revenue OQ_1 times P_1, the seller gets a revenue increment when he sells the quantity Q_1Q_2 at P_2.

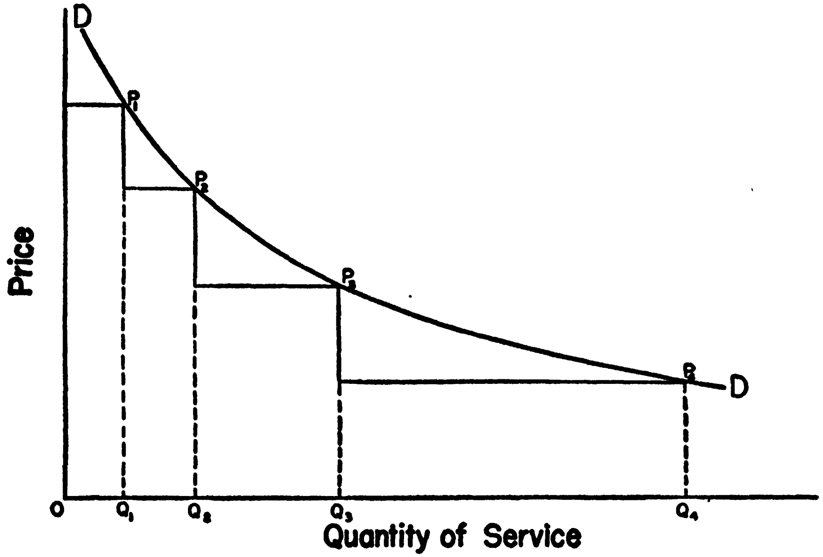

FIG. 19.

In Figure 19 the demand curve represents the aggregate demand of a whole buyer classification rather than the demand of an individual or average buyer. A block-price schedule is designed, however, for individual buyers. This fact does not alter the demand-price basis of block-rate scheduling. Rather, the price schedule is based on the individual demand behavior instead of the aggregate demand of the buyer group. There are many kinds of individual consumer demands for service—almost as many as the number of buyers. Even if they are in the same buyer classification and even if they make similar uses of utility service, all residential consumers of electricity, for instance, are not willing to buy the same quantities of electricity at the chosen block prices. They have different demand curves. Thus, when the electric company adjusts the block schedule to the individual demand behavior, it cannot choose block prices and block sizes that fit the demands of all buyers. Any choice favors some buyers and is a poor choice for other customers. Some buyers are willing to pay more than the block prices for the service units in each block, and others are willing to pay less than the block prices for the same service units. Yet this is an unavoidable condition of quantity-discount pricing; a single price schedule for a whole buyer classification cannot be adjusted to every difference in the individual buyer demands.

The choice of the block prices and block sizes usually is made by the utility-company managers or their rate engineers. Commissions order revisions now and then of block prices and block sizes, but they seldom determine the price schedules. Being under the control of company managers, block-price schedules are shaped by the private interest in revenue and earnings. Private firms have an obvious interest in the quantity-discount pricing with block schedules; for they can get more revenue for their service thereby than with uniform unit prices. When this kind of price differentiation is used, the total expenditures of the average buyer are larger than with uniform prices.

A simple example demonstrates the opportunity for revenue increments from block-price schedules. Let us suppose that an electric company chooses the following block schedule:

First	20 kw.-hrs. each month	10¢ a kw.-hr.
Next	30 kw.-hrs. each month	8¢ a kw.-hr.
Next	150 kw.-hrs. each month	5¢ a kw.-hr.
Over	200 kw.-hrs. each month	4¢ a kw.-hr.

Even when some buyers extend their consumption into the last block, the company gains revenue from the price differentiation. Selling to a large individual buyer, the company measures the gain in the manner shown in the table on the following page.

The last column does not show the whole revenue increment of block differentiation of prices. It shows only the revenue increments from the buyers who demand service in the lower blocks. Many other consumers do not extend their consumption beyond either the first, second, or third blocks of service. Take the cases of buyers who commonly consume only

Differentiated Pricing				Uniform Pricing			
Units	Block price	Marginal outlay	Total outlay	Units	Uniform price	Total outlay	Differ. pricing gain
First 20	10¢	$2.00	$2.00	20	10¢	$2.00	
Next 30	8	2.40	4.40	50	8	4.00	$0.40
Next 150	5	7.50	11.90	200	5	10.00	1.90
Next 200	4	8.00	19.90	400	4	16.00	3.90

20 kilowatt-hours a month. They buy 20 kilowatt-hours at 10 cents a unit. And they still are willing to buy only 20, perhaps 25 or 30 kilowatt-hours, at a uniform price of 4 cents a unit. Their demand for electricity clearly is inelastic. They spend $2 for 20 kilowatt-hours at 10 cents a unit; but they are willing to spend only $1.20 for 30 kilowatt-hours at a uniform price of 4 cents a unit. The block form of price differentiation allows a company to get more revenue from the buyers who have an inelastic demand for service. From the viewpoint of a utility company, then, the advantage of this price differentiation is obvious: it gives price reductions to buyers who are willing to increase their total expenditures for service.

The block-price schedule or any other form of quantity-discount pricing is a kind of monopoly pricing. When they use these kinds of price differentiation, utility companies use their monopolistic market positions, and take advantage of the differences in individual buyers' demands. They do not choose block prices and block sizes so that every buyer or even most buyers purchase some service at the lowest block prices. Block schedules are not based on a modal demand behavior; they are not based on the commonest demand curves. Yet, while utility companies use block-price schedules to get more total revenue than they can get with uniform prices, they usually do not try to maximize the revenue gains of block-price differentiation. They do not attempt full exploitation of individual demands.

A restricted monopoly pricing is evident in most block schedules. The size of the first block or first two blocks often is quite small, allowing many small consumers opportunities to buy some service at a lower price than the first block price. If companies really try to maximize the total revenue and net earnings, they doubtless can increase their total revenue by increasing the sizes of the initial blocks. And the block sizes are rounded off. A company offers 20 kilowatt-hours at 10 cents a unit, the next 30 kilowatt-hours at 8 cents a unit, and so on. It does not sell 23 kilowatt-hours at 10 cents, the next 38 units at 8 cents and so on, even though more refined choices of block sizes may provide additional increments in the total revenue. They are satisfied with substantial increments in total revenue, and are not determined to have the largest possible increments.

Knowledge of demand behavior is a further condition of block rate scheduling. A smooth demand curve, as in Figure 19, demonstrates the demand basis for price differentiation. But the managers and rate experts of utility companies do not have the demand curves for many individual buyers from which they can choose block prices and block sizes. They know that buyers are willing to take more service at low prices than at high prices of a schedule, and that different individual buyers do not wish to buy the same quantities of service at each block price. Yet they do not know exactly how much service the individual buyers or all buyers are willing to purchase at certain prices. Consequently the block prices and block sizes are estimates; they are based on what the managers and rate experts think the consumer demands are. The block rate schedules, furthermore, are not based necessarily on immediate demand conditions. Companies do not change block sizes and block prices each time a significant increase or decrease occurs in the buyer demands. When buyer incomes decline during a depression, the block sizes usually are not scaled down. Even when a substitute service appears and the demand for the utility company's service decreases, the block prices are not changed immediately. And the block prices are not increased so soon as buyer incomes and demands increase.

Demand behavior is different, too, with uniform prices and with block-price differentiation. The buyers' expenditures for initial blocks of service affect their demands for the low-priced blocks of service. Using a block-price schedule, a company has an average-revenue curve that is above the demand curve of the buyers.[8] This effect of demand-price differentiation is illustrated in Figure 20. Because the company revenue is higher with a block-price schedule than it is with a uniform price, the average-revenue curve is not equal to the demand curve. Selling one quantity at P_1 and another quantity at P_2, the firm receives a larger amount of revenue than if it sells both quantities at P_2; this increment in total revenue is measured by the rectangular area *A*. And if the company sells at a series of prices, P_1, P_2, P_3, and P_4 rather than a single price, P_4, it receives the successive revenue increments that are shown in the rectangular areas *A*, *B*, and *C*. Under these conditions the average-revenue curve necessarily must be above the demand curve on which the differential prices are based.

When economists define the demand for a commodity, they think of uniform prices instead of differentiated prices. The demand for a com-

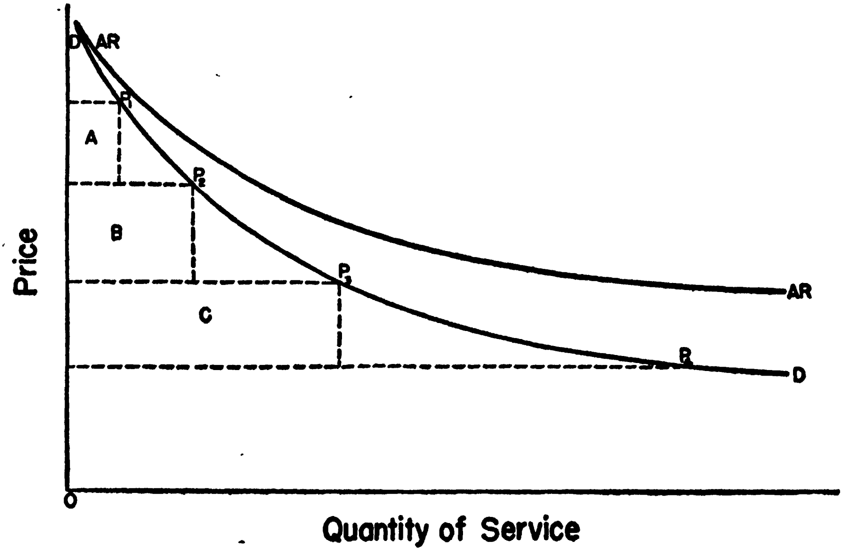

FIG. 20.

modity is the quantities of the commodity that buyers are willing to purchase at various uniform prices. For this reason a seller's average revenue for a quantity of service is equal to the buyers' demand price for the same quantity; and the seller's average-revenue curve is equal to the buyers' demand curve. But here, as a consequence of block-price differentiation, the average-revenue curve of the utility company is above the demand curve of the consumer classification, even though the two curves necessarily are related. There is a further distinction: block-price differentiation affects the demand for service, tending to reduce the quantities of service that buyers are willing to purchase at the low block prices. This demand effect of price differentiation is a result of the additional expenditures that each buyer must make as his consumption increases. A family has a limited amount of income to spend on all kinds of commodities. If it spends $5 for the first two blocks of service, it is less willing to buy additional service than if it spends $3 on the first two blocks of service. As a family increases its outlay for utility service, it becomes less and less willing to give up other kinds of consumption so that more utility service can be purchased.

Relation to Class Pricing. Sometimes the block sizes and block prices are fitted to the several domestic uses of electricity or gas.[4] In an electric schedule the first block can be approximately equal to an average consumer's use of electricity for lighting and incidental purposes; the size of the second block is about as large as an ordinary buyer's consumption for refrigeration and other appliance uses; the size of the third block fits a typical buyer's use of electricity for cooking; and the last and "open" block is available for water heating and miscellaneous uses of electricity. An example of such a block schedule is:

First 25 kw.-hrs.	—Lighting and incidental uses	7¢ a kw.-hr.
Next 75 kw.-hrs.	—Refrigeration and appliances	4¢ a kw.-hr.
Next 100 kw.-hrs.	—Cooking	3¢ a kw.-hr.
Over 200 kw.-hrs.	—Water heating and miscellaneous	15¢ a kw.-hr.

And when gas companies arrange this sort of block schedule, the first block provides cooking service, the second is used for water heating, and the third is for space heating and miscellaneous uses of gas. Most gas and electric companies, however, usually do not integrate the block sizes and prices with separable uses of service. Each block is not designed for some single, specific use of service. Yet, when they choose block sizes and descending scales of prices, electric and gas companies do give some attention to different service uses. At least the block sizes seem to be related roughly to the several domestic uses of gas and electricity. Even when water companies construct block rate schedules, they give some attention to the several domestic uses of water.

When price schedules are differentiated according to the service uses, the companies have a kind of class pricing.* In these cases the price differentiations are controlled by the demand elasticities. Gas companies, for instance, seem to experience an inelastic or slightly elastic demand for cooking uses, a somewhat elastic demand for water heating, and a clearly elastic demand for space heating. Consequently when a gas company fixes the highest price for cooking use, the next highest price for water-heating service, and the lowest price for space heating, it can get additional revenue and more earnings. As long as the alternatives are so imperfect, the demand for lighting use of electricity is bound to be inelastic. Likewise, the demand for ironing- and washing-machine use of electricity seems to be inelastic. The demand for refrigeration use of electricity may be slightly elastic, though the demand for it, like the demand for lighting use of electricity, becomes inelastic after families are habituated to the use of electric refrigerators. But the electricity demand for cooking is more elastic than that for most other domestic uses, because the buyers have several alternative sources of cooking fuel. Considering these demand elasticities, an acquisitive electric company charges the highest price for lighting sales and small-appliance uses, a lower price for refrigeration use, and a still lower price for cooking consumption of electricity.

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* State commissions sometimes prefer block-schedule differentiation of service uses instead of separate classifications of domestic service.[5] They prefer a separate block for electric stove consumption, for instance, rather than a separate service classification for the owners of electric stoves. A committee of the National Association of Railroad and Utilities Commissioners proposes, in fact, that each block of an electric schedule be chosen for a different use: the first block for lighting sales, the second for operation of small appliances, the third for refrigeration, and so on.[6]

Just as price differentiation according to the demand elasticities is not achieved perfectly between buyer classes, so it is not accomplished perfectly in price schedules. Rate-schedule variations between companies are evidence of the imperfect price differentiations. The first block of one company's schedule is about large enough, let us say, to cover only the ordinary buyer's lighting use of electricity. Then the electricity for ironing and the operation of some other appliances, for which most consumers seem to have an inelastic demand, is purchased at a lower block price. But another company has a large initial block; the block is large enough to cover lighting, small-appliance, washing-machine, and even refrigeration uses of electricity. Neither of these companies differentiates the block prices perfectly according to the demand elasticities for different electricity uses. Yet, apart from the imperfections of price schedules, demand elasticity is a factor in block-price differentiation. Just as the sizes of the blocks bear a relationship to the uses of gas, electricity, and water, so the block prices seem to be based, in part, on differences in the demand elasticities.

Demand of Industrial Buyers. As they construct their price schedules, the electric, gas, and water companies commonly differentiate between the large and small industrial buyers. Price differentiation between industrial customers is often greater, indeed, than the differentiation between domestic buyers. Industrial and commercial price schedules usually contain more blocks than those in the ordinary residential schedules for electric, gas, or water service. And readiness-to-serve charges, particularly in the electric industry, often are blocked. A blocked readiness-to-serve charge cannot be explained by the traditional cost analysis of utility companies. Using the customary reasoning, a company manager says that the readiness-to-serve charge of an individual buyer is determined by the maximum demand of the buyer. If this is true, then the charge increases in proportion to increases in maximum demand. But when a company blocks the demand charge, it implies that an industrial consumer's "responsibility" for plant investment is not proportionate to his maximum demand. Even if the aggregate maximum demands of several small industrial buyers are equal to the maximum demand of a large industrial company, the readiness-to-serve charge of the large customer is smaller than the total readiness-to-serve charges of the small buyers. Even if the load factor of the several small firms is as high as or higher than the load factor of the large industrial customer, the small firms still pay more readiness-to-serve charges.[7] Clearly, then, the differentiation between industrial buyers does not seem to be based altogether on cost differentials.

The real consideration of industrial rate making seems to be the elasticities of the buyers' demands. A small industrial firm can install its own electric plant. But it cannot produce its own electricity so cheaply as the large industrial firm can, the alternative cost of utility-company electricity being higher for the small industrialist than for the large manufacturer. Similarly, the large industrial buyer of gas is able to use others fuels more economically than the small industrialist. Consequently, when gas and electric companies differentiate between industrial consumers, they consider the costs of alternative services, including the industrialists' own costs of gas and electricity production. They apparently believe that these alternatives costs decline as the quantity of an individual buyer's purchases increases. Thus they believe that the demand curve of industrial customers becomes more elastic as it slopes downward.

EVOLUTION OF QUANTITY-DISCOUNT PRICING

Based on the demand prices of a buyer class, block-price scheduling is unquestionably a discriminatory form of pricing. But the limits of the price discrimination depend on the company's knowledge of buyer-demand behavior, and on the firm's willingness to exploit its knowledge of the demand conditions. Companies do not know exactly the quantities of service that they can sell at a large number of possible prices. Their knowledge of demand does not shape up graphically in the form of a demand curve. Using its own experiences or the experiences of other firms, a utility company believes that it can sell a certain quantity, more or less, at one price, another quantity, more or less, at another price, and so on.

As they develop a discriminatory pattern of prices, companies also must recognize possible buyer and commission objections to extensive price differentiation. They are restricted by the pricing customs of the industry and the regulators. A firm's revenue increases, to be sure, as the number of blocks in a schedule increases. Just as a two-block schedule brings in more revenue than a uniform price, so a four-block schedule gives a company more revenue than a two-block schedule, and an eight-block schedule produces more revenue than a four-block schedule. No company wants to guess at the block prices and to administer a schedule of twenty-five, fifty, or one hundred blocks. But some companies, seeing a good chance for more revenue, may want to increase the number of blocks from four to eight, or even from eight to twelve. Commissions oppose extensive refinements of price differentiation. Commissions allow a larger number of blocks in industrial schedules than they approve for residential schedules. But they want the companies to use simple and conventional price schedules, following the traditional forms of price differentiation and choosing sensible and understandable price schedules. Commissions do not insist on uniform prices; nor do they want a large number of price differentials.

Demand-price differentiation is dependent, like class pricing, on the nontransferability of service between buyers. A buyer, who extends his purchases into the low-price blocks, can upset the demand-price differentiation if he resells service to the small consumers who confine their purchases to the first one or two blocks of a rate schedule. Submetering of electricity, for example, interferes with demand-price differentiation. A submetering person or company can make large purchases and can obtain large quantity discounts; then he resells his electricity purchases to small buyers at the same prices that they would pay to the utility company. Some benefits of demand-price differentiation go, thereby, to the submeterer instead of the utility firm. Except in New York, the state commissions do not require service to submeterers, though none of the commissions seem to realize that the profits of submetering are evidence of discriminatory pricing.

The quantity-discount differentiation of prices evolved slowly. Figures 19 and 20 demonstrated the relationship between a demand curve and block-price schedule; but no utility company ever developed its demand-price differentiation in a single day or year, Unused plant capacity, technological innovations, and increases in demand induced utility companies to offer more and more quantity discounts. As these technical and demand changes occurred, the managers saw opportunities to increase their earnings with price differentiations. When the revenue increment from new sales was expected to exceed the cost increment on the additional output, a firm offered its buyers a chance to purchase additional service at low prices. A new, low-price block of service was a way to utilize plant capacity and technical changes, to extend the limits of service consumption, and to increase the company earnings.

A Simple Beginning. As a historical fact, most electric and gas companies sold their services at uniform prices before they turned to demand-price differentiation. Let us suppose, therefore, that the company in our example sells service at a uniform price. When this price is reduced, this firm can enlarge its output and make more complete use of its plant. If the buyer demand is inelastic, a reduction of the uniform price decreases the company's earnings. And if the demand is only moderately elastic, a reduction of the uniform price gives the company only a small increment in total revenue. When the firm, on the other hand, retains the original uniform price for the existing sales and offers a lower price for the new sales, the firm does not take a long chance on the reduction of its existing earnings. Offering a price reduction to buyers who are willing to increase their consumption of service, it not only avoids the risk of a revenue loss but also may get more earnings.

This case for a simple or two-price differentiation is illustrated in Figure 21. The original and uniform price is P_1; using this price, the company sells OQ_1 units of service. P_1 is not necessarily a simple monopoly price that is determined by an equation of marginal revenue and marginal cost. This price may be fixed by the regulators. Given this initial price for OQ_1 sales, the company can obtain increments in total revenue by selling an additional service at a lower price. As long as the firm sells an OQ_1 quantity at the uniform price P_1, it ignores the willingness of buyers to purchase service at prices other than P_1. The demand curve in Figure 21 shows that consumers are willing to purchase service at prices below P_1. One special characteristic of the D curve must not be overlooked: selling some service at P_1, the company affects the demand at lower prices. A marginal-revenue curve (MR) is derived from the demand curve (D), but only the revenue increments below P_1 are signifi-

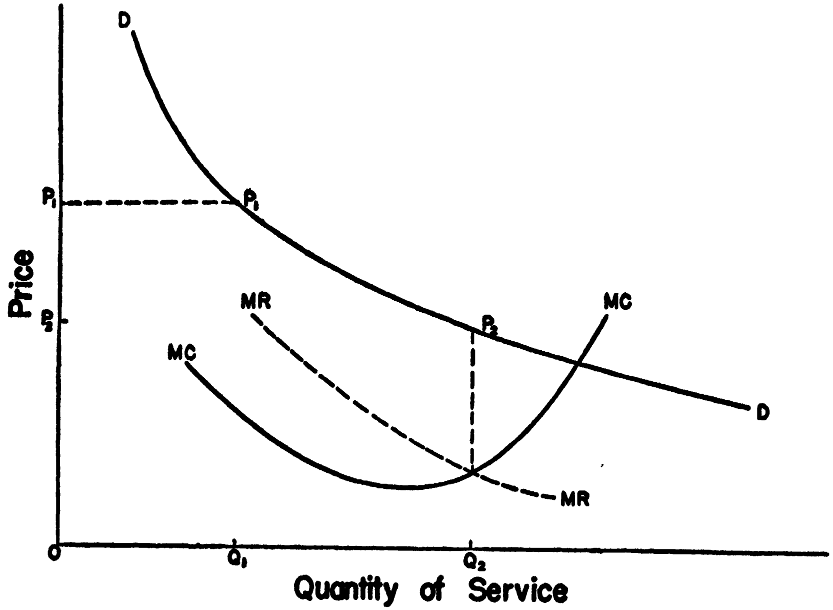

FIG. 21.

cant in this pricing situation. If only one quantity-discount price is offered to the buyers and if the maximum addition to the company's earnings is desired, the second price is set at P_2.[8] Like a simple monopoly price, P_2 is determined by the intersection of the marginal-revenue and marginal-cost curves.* And the company now sells the quantity OQ_1 at P_1, and the quantity Q_1Q_2 at P_2.

This simple case of demand-price discrimination can be used to illustrate the operation of the "increment-cost" rule of pricing, the rule that is used so often to defend all kinds of price differentiation. The company has unused plant capacity, either during the off-peak periods or during all the time periods of operations. Treating the new sales as incidental business, the firm offers a price reduction on the new output if the expected revenue increment exceeds the expected cost increment. When the principles of monopoly pricing are followed, the price (e.g., P_2 of Figure 21) is fixed at the point where the marginal cost is equal to the marginal revenue. Such an increase in earnings can be used to reduce the overhead costs that otherwise are charged to the original service units. But the overhead costs of production do not determine the quantity-discount price, P_2. Instead, the choice of this price is controlled by the demand elasticity below the initial price P_1, and by the marginal costs of operation.

Cost Conditions. The position and slope of the marginal-cost curve affects the choice of the quantity-discount price or prices. If the marginal-cost curve is below its position in Figure 21, the second price is lower than P_2 in Figure 21. Furthermore, as the upward slope of the marginal-cost curve increases, the price (P_2) increases. Figure 22 demonstrates the relation of marginal-cost behavior to demand-price differentiation. When a company operates under a condition of increasing marginal costs and the marginal-cost curve is MC_1, the quantity-discount price is fixed at P_2. But when the marginal costs are constant and are represented by the curve MC_2, a lower price, P_3, is fixed for the additional sales.[9]

A rising marginal-cost curve often can be considered evidence that the idle plant capacity is decreasing. As idle productive capacity disappears and maximum use of the plant is near at hand, the company cannot continue to get large increments in earnings when price reductions are offered on new sales. Perhaps the company can obtain revenue increments from further differentiation; but increments in costs, including additional investments in plant capacity, can be larger than the revenue increments, making any further price differentiation unprofitable. Let

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* A large number of quantity-discount prices provide further enlargements of the company's earnings. If the special costs of price differentiation are excluded, first-degree discrimination of prices is certain to be more profitable than second-degree discrimination.

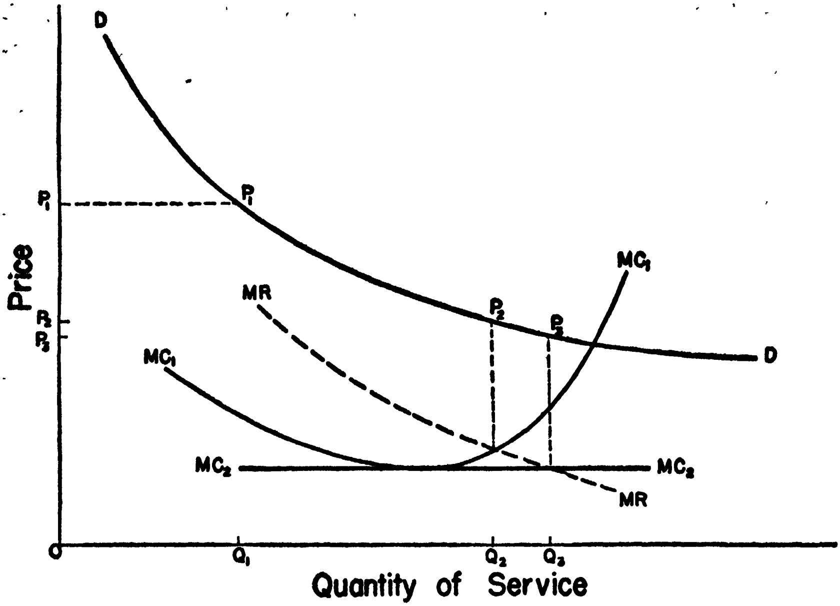

FIG. 22.

us turn this condition around. A firm has a considerable amount of unused plant capacity. When the company sells service at a uniform price, the marginal-cost curve is sloping downward. The marginal costs of production decline, indeed, even though the output is extended beyond the sales at a uniform price. Given these conditions, the firm can afford a larger quantity-discount price than when the marginal costs of production (as in Figure 22) are constant or are increasing.

The effect of excessive plant capacity on demand-price differentiation is illustrated in Figure 23, a diagram that is like the preceding figure except for the position of the marginal-cost curve. The quantity-discount price, P_2, is lower than when plant capacity is scarce, and when the marginal-cost curve is above the position of *MC* in Figure 23. Intersection of the marginal-revenue and marginal-cost curves occurs farther down on the marginal-revenue curve, because the marginal costs are decreasing. And the increment in output, Q_1Q_2, is larger than with an increasing marginal cost and scarcity of plant capacity. This output increment is larger, of course, because the price differential between P_1 and P_2 is larger. Consequently a poor investment decision, resulting in a large amount of plant capacity relative to the demand for service, accentuates the demand-price differentiation.

Factual evidence is not available to show how the scarcity or ex-

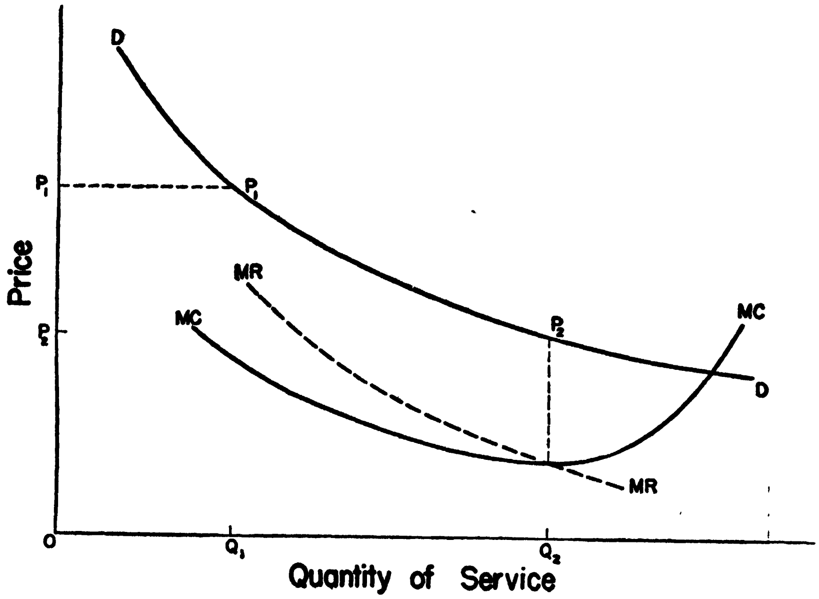

FIG. 23.

cessiveness of plant capacity affects the demand-price differentiation. Perhaps the relation of unused plant capacity and block-price differentiation is exaggerated. At least the electric and gas companies, which practice most of the price-schedule differentiation between individual buyers, never have large amounts of excessive plant capacity. They always have much off-peak capacity for service. But off-peak capacity is not applicable to this kind of price differentiation; it is not used to serve the regular consumers. If at times the investment in electric plant seems excessive, the excess capacity usually is wiped out by demand increases. Electric companies commonly have a substantial reserve capacity. But the reserve plant capacity is not clearly excessive capacity; it is a planned capacity, and is designed to meet sudden demand changes. Gas companies, however, probably have some unnecessary plant capacity now and then. Managers of electric and gas firms often explain price-schedule differentiation in terms of unused plant capacity; the revenue increment from a new, low price exceeds the increase in "out-of-pocket" costs, and can be used to reduce the old, high prices. This explanation often seems to be an afterthought. But it serves a useful purpose: it diverts public attention from the discriminatory pattern of prices.

Effects of New Economies. Cost-reducing innovations, such as technical changes in electric generating plants, encouraged the utility companies to offer quantity-discount prices. They were important reasons. particularly in the electric industry, for demand-price differentiation. Technical economies frequently required heavy investments in durable plant. Before a company made such an investment, it foresaw an earnings increment. The innovation earnings were used to cover not only the depreciation and investor-return costs of the new plant, but also the undepreciated investment of the old equipment. To realize these increases in earnings, a firm apparently believed it was compelled to differentiate prices. Disliking general price reductions, the company kept the old prices for the established outputs and introduced a new block of service at a lower price.

This relationship of technological innovations and demand-price discrimination is illustrated in Figure 24. Cost behavior under the original technical conditions of production is represented by the marginal-cost curve, MC_1. Operating under these cost conditions, a company has only a limited opportunity for price differentiation. Keeping the price, P_1, for output OQ_1, the company can afford to offer a quantity Q_1Q_2 at a new price, P_2. But the difference between the new price, P_2, and the established uniform price, P_1, is small. Only a modest increment in output (Q_1Q_2) and earnings can be obtained with the price differentiation. The increment in output and earnings is so small, in fact, that the com-

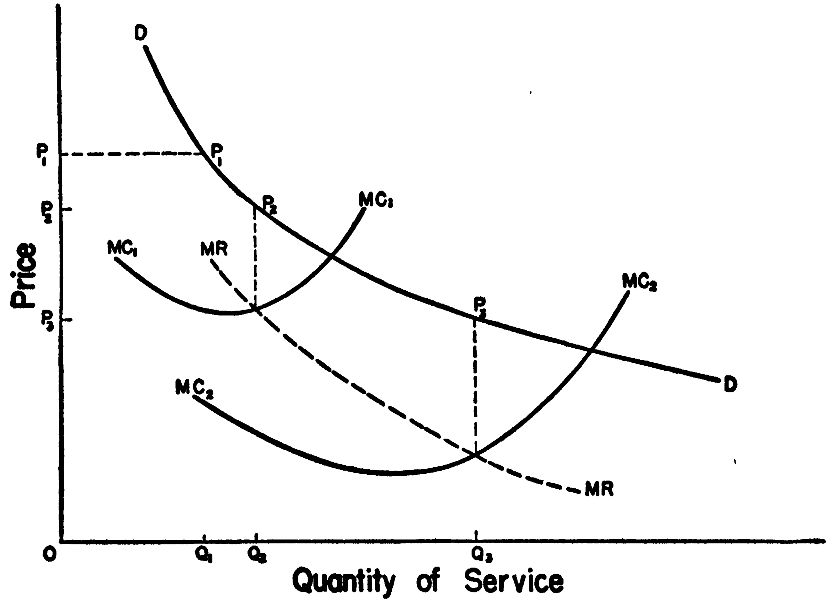

Fig. 24.

pany may not bother with price differentiation. But when some large economy of production is available, the firm anticipates a large increment in earnings and is induced to try some discriminatory pricing. In Figure 24 the cost effect of the plant improvement is shown by a new marginal-cost curve, MC_2, which is below the old marginal-cost curve. Given this substantial economy of production, the company can afford to sell a Q_1Q_3 increment in service at a price of P_3.

Important technological changes appear suddenly; other innovations accumulate gradually. Long-distance lines for the transportation of natural gas suddenly offered large economies to investors, and to transmission or distribution companies. On the other hand, technical refinements of electricity generation and distribution were realized over a long period of time. Block-price differentiation seemed to be closely associated with successive technical changes in service production; the differentiation became more complex as more and more production economies were available.

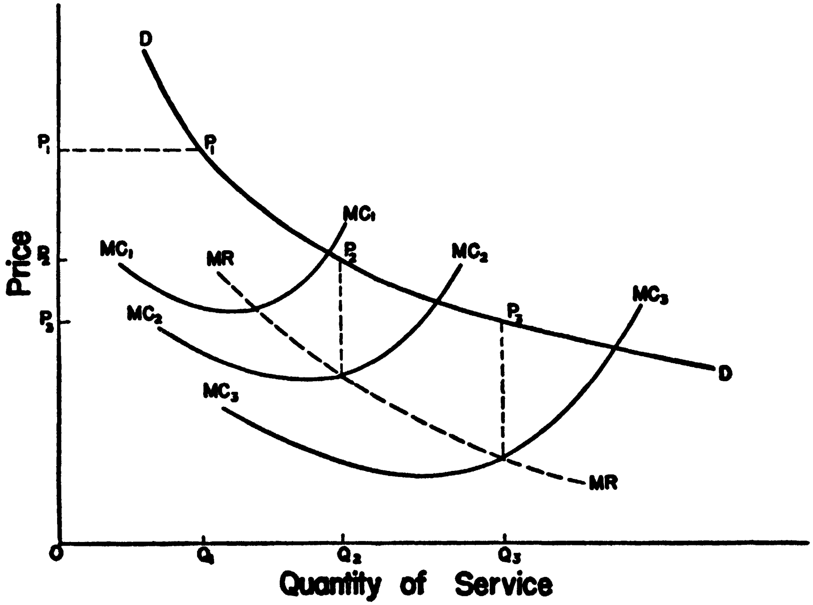

Fig. 25.

Figure 25 illustrates the way in which a sequence of technological changes can cause successive changes in the block schedules. A fixed demand (D) for service is assumed so that attention can be concentrated on the effects of cost changes. In the beginning the company sells an output OQ_1 at a uniform unit price of P_1. At this stage of operations the cost condition is represented by MC_1. Later, cost economies, represented by the new marginal-cost curve MC_2, are realized. And when the revenue increments below P_1 are measured by the marginal-revenue curve MR, the second block price is P_2. At a still later time, further economies of production, represented by the third marginal-cost curve MC_3, are realized. Now the firm can get another earnings increment when it adds another block to the price schedule. Keeping the P_2 price for the output Q_1Q_2, the company can get another earnings increment when it adds a third block to the price schedule. This quantity-discount price, P_3, is determined by the intersection of the MC_3 and MR curves; and the new output increment is Q_2Q_3.

Effects of Demand Increases. Differential pricing, particularly in the electric industry, also developed in conjunction with demand increases. As long as residential consumers used electricity wholly or predominantly for lighting service, the electric companies gave no thought to price differentiation, being satisfied with uniform prices. Then the development of the electric iron, motor-driven washing machine, and lesser appliances brought increases in the electricity demand. Rate schedules were blocked and lower prices were offered to those persons who would use the new appliances. Further quantity discounts were offered, too, when the electricity demand increased after electric stoves and electric refrigerators were developed. Some companies even created a special low-price block for cooking customers. Similarly, the blocking of gas rate schedules was related, historically, to the new uses of gas service and to the consequent increases in the gas demand. When domestic use of gas was confined chiefly to cooking uses, a uniform price was common. But when gas companies first sought water-heating sales and later developed space-heating sales, they gave more attention to differentiated price schedules.*

Figure 26 illustrates the relationship of demand increases and demand-price differentiation. The cost conditions, shown by MC, are fixed so that attention can be focused on the effects of the demand changes. The three demand curves, D_1, D_2, and D_3, are the demands for a company's service at three successive points of time. Experiencing the demand condition D_1, the company can afford to add a block price for additional sales. But the increments in output and earnings are small. When the demand increases to D_2, considerable increments in output and earnings can be obtained with block-price differentiation. The marginal-revenue curve MR_2, measuring the revenue increments along the D_2 curve, intersects the MC curve, and determines the discount price P_2. When the demand increases to D_3, a further discount price is offered to buyers. The intersection of the marginal-revenue curve MR_3, which is derived from the D_3 curve, and the marginal-cost curve determines the P_3 price. When

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*The differentiation of industrial price schedules for gas and electricity also was related to demand increases, but the relationship was not so evident as in the domestic schedules. Rate experts studied closely the blocking of energy and demand charges as the industrial buyers increased their demands for electric power and gas. But the alternative costs of industrial gas and electric service—the elasticities of the service demands—were basic factors in the price discrimination between industrial buyers.

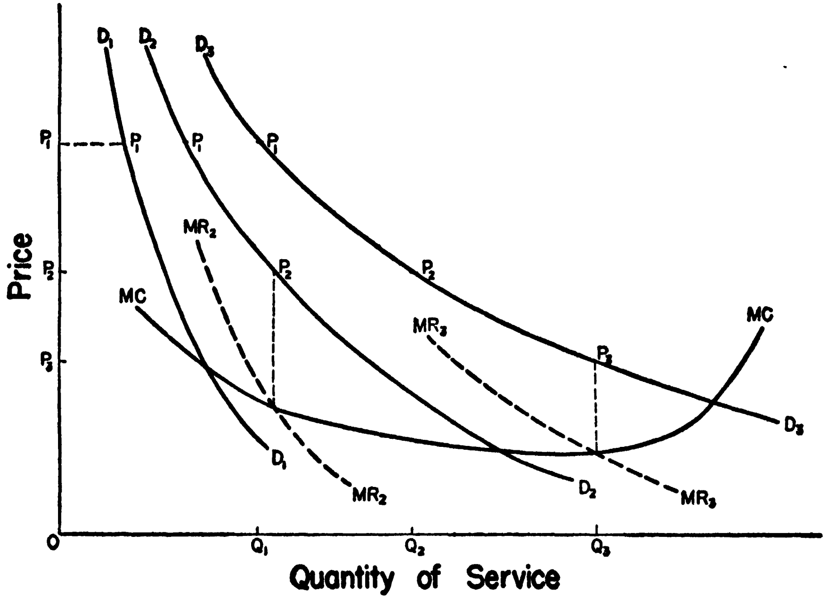

FIG. 26.

these three prices make up the price schedule of an individual buyer and when the demand is D_3, the company sells an OQ_1 quantity at P_1, quantity Q_1Q_2 at P_2, and quantity Q_2Q_3 at P_3.

A Summation. The evolution of price schedules is not a simple affair that can be explained completely with economists' diagrams. Company managers and rate engineers did not have a great deal of cost and demand data—enough information to draw precisely the marginal-revenue and marginal-cost curves. Leaders in the price differentiation made imperfect calculations. Other firms followed the leaders, copying differentiations rather than working out their own pricing patterns. A favorite rationale of price differentiation was (and still is) based on unused plant capacity and decreasing production costs with the established plant. Yet two other conditions seemed to be more important: technical innovations and increases in demand. A utility company often could realize cost economies with a larger and more efficient scale of production, and new uses of service (which often were results of other technical developments) afforded opportunities for increments in total revenue. Discriminatory differentiation of price schedules was another product of industrial expansion.

THE "DEMAND" FORMS OF DOMESTIC SCHEDULES

The Wright demand and room rates also are discriminatory prices. If these price forms are used, the maximum demands are the basis of price differentiations between residential customers. The Wright demand form of pricing differentiates between individual buyers according to the equipment that they possess for service consumption. The connected load of each buyer determines the price schedule for each buyer. An electric consumer's load is the rated capacity or some arbitrary percentage of the rated capacity of his bulbs, sockets, and appliances; and the connected load of a gas consumer is measured, too, by the capacity of his gas-using appliances. When a company has a block schedule of prices, the block sizes for individual buyers vary with the connected loads. The room or area rate involves a similar form of price differentiation. As the rooms or area of a home increase, the block sizes of the consumer's price schedule increase. Before he begins to buy service at the second block price, the owner of a large home must buy more electricity or gas at the initial block price (or at any block price) than the owner of a small home does.

The Wright and room forms of pricing discriminate between buyers according to their wealth or income differences. Purchases of light fixtures and appliances commonly vary with the wealth and incomes of the buyers. In particular the purchases of expensive electric or gas appliances are certain to be functions of buyers' wealth or incomes. When a family can afford a large number of appliances, the Wright demand rate discriminates against the family and makes it buy larger amounts of service at each block price than the less affluent families purchase. A similar basis of price differentiation is used in the room rate: just as the sizes of new homes usually vary with the incomes of their owners, the block sizes of a room rate also vary in the same way. These price forms exploit the consumers' ability to purchase electricity or gas. Appliances and rooms are rough indexes of purchasing power. Buyers with high incomes usually have higher demands for electricity or gas than buyers with modest incomes; and families in the middle-income group have higher demands than poor consumers for most utility services.[10]

This relation of the Wright and room rates to the individual buyers' demands is described in Figure 27. Let us suppose that there is a block schedule with three prices, P_1, P_2, and P_3. The curves, A_d, B_d, and C_d, represent the demands of three different buyers; each of these customers has a different series of demand prices for utility service. At P_1 these three buyers are willing to buy different quantities of utility service; they also are willing to purchase different quantities of service at prices P_2 and P_3. Consequently, if the utility company is inclined to exploit these differences in demand, it varies the size of the P_1, P_2, and P_3 blocks according to the buyers' demands. When a customer has an A_d demand, the company chooses blocks OQ_1, Q_1Q_2, and Q_2Q_3 for the prices P_1, P_2, and P_3 respectively. Likewise, when a buyer has a B_d demand, the blocks OR_1, R_1R_2 and R_2R_3 are fixed for the prices P_1, P_2, and P_3 respectively; and so on for the customer who has a C_d demand.

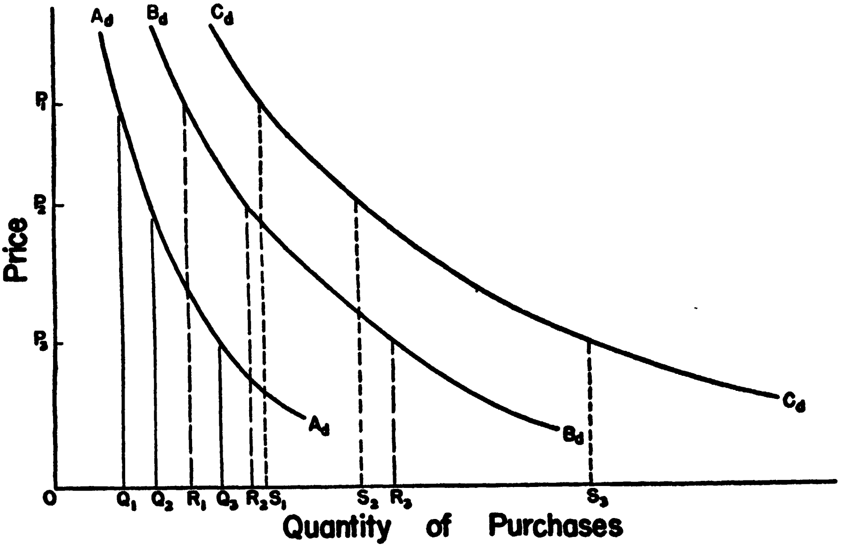

FIG. 27.

Such a direct relation between demand curves and block sizes actually never is established in public utility pricing. Yet these demand curves generalize the price discrimination that occurs with the Wright and room rates. Variations in the connected loads or the sizes of homes afford rough measures of demand differences; there is a relation between connected load differences and the different quantities that buyers are willing to purchase at the established block prices. Perhaps the utility companies are not aware of the discriminatory nature of the Wright and room rates, just as they do not seem to be cognizant of discriminatory pricing in general. During the times when the Wright and room forms of pricing were in common use, the companies apparently were preoccupied with the demand allocations of overhead costs. Likewise, the commissions did not understand the discriminatory nature of these pricing forms. Some commissions, for instance, forbade the use of room rates because, since both poor and wealthy persons lived in larger houses, the possession of appliances was not always proportionate to the sizes of the homes.[11] They objected to an imperfection of the room rate: the failure to distinguish between wealthy and poor occupants of large homes, or between new and old homes. But they did not see the demand differentiation between buyers.

SERVICE CHARGES AND MINIMUM BILLS

Commissions and students accept the fact that some costs of utility-company operations are functions of the number of customers. Thus a service charge or minimum bill, based on these customer costs, is considered a nondiscriminatory charge. A utility firm is able to assess service charges or require the payment of minimum bills, because it has monopoly control of a market. If every market contains many competing firms, these charges are used infrequently. Even though some costs of nonutility firms vary, too, with the number of buyers, these firms usually do not assess service charges or minimum bills against the customers. Even when they operate under conditions of monopolistic competition, nonutility companies usually do not collect service charges or require some minimum expenditure for service. Department stores do not commonly assess charges against persons who take up the time of clerks or who are "just looking around." Many of them even do not add a separate charge for deliveries; and others allow the buyers to return merchandise. Retailing firms, indeed, try to offer extra and distinctive services to individual customers.

A further fact is evident. The service-charge and minimum-bill forms of pricing are ways to stabilize the revenues of utility firms.[12] Wanting access to utility services, many buyers are willing to pay high prices for a few units of service. When a person does not cook meals regularly, he still may want the opportunity to cook meals with gas. Although a family is away from home much of the time, it still wants to use electricity when it is at home. Even if the consumer does not need much gas or electricity, he is willing to pay a high unit price for a small amount of service. Consequently a service charge or minimum bill gives the gas or electric company assurance of more revenue than that of a straight block schedule. Similarly, the telephone companies, choosing high initial bills for their services, can stabilize their revenue and earnings. Many persons buy telephone service mainly because they want to get medical and other services quickly. They buy a sort of insurance against unknown conditions; they are willing to pay substantial initial prices each month so that they can have access to a prompt communication service. The significant factor is the stable telephone revenue that is realized with the large initial bills. When the company charges $4 a month for sixty-five calls, it is assured a minimum amount of revenue whether the customer makes twenty-five, forty, fifty, or sixty-five calls each month.

Are service charges, minimum bills, and initial bills discriminatory forms of pricing? The answer to this question depends, in part, on the size of the service charges, minimum bills, and initial bills. Some of them seem to be explained by the customer costs of service. This is the case, apparently, with most service charges or minimum bills of electric, gas, and water firms. These kinds of companies can collect the charges because the demand behavior of buyers allows it, because the buyers are willing to pay high unit prices so that they can consume small amounts of service. When the minimum bills and service charges are around a dollar a month for each buyer, the electric, gas, and water companies usually can show an equal amount of customer costs for the average buyer. But the initial bills of telephone service are much larger than the customer costs of service. These initial bills of the telephone systems, which vary with the maximum number of calls each month and with the number of parties on each line, range from about $2 to $5 a month in large cities. They are large initial bills from which the companies expect to get enough revenue to cover all service costs. They are discriminatory class prices. The initial bills of telephone systems are based on the buyers' demands, not the costs of different services.

FORMULATION OF A PUBLIC POLICY

If they want to formulate a comprehensive policy of discriminatory pricing, regulators must start from scratch. The first step in such a process is an understanding of price discrimination. Commissioners do not seem to realize that differences in the demand elasticities of buyer groups are the basis of class pricing. And they do not understand that the choices of block sizes and block prices of rate schedules represent another kind of demand-price differentiation. Indeed, they praise promotional pricing, never knowing apparently that a promotional schedule of prices is drawn from the demand prices of the buyers. Until they study and understand the characteristics of price discrimination, commissions never can determine intelligently the desirable social limits of the discrimination.

Acceptance of Discriminatory Schedules. Even if utility price schedules commonly are discriminatory, they still can be acceptable pricing forms. Demand-price differentiation, like class pricing, achieves certain results that cannot be realized with uniform prices. The output of service is larger with discriminatory prices than with uniform prices. Using a discriminatory pattern of prices, electric companies rapidly expanded the consumption of electricity. The use of electricity for refrigeration, cooking, and numerous household appliances was quickly and greatly widened by means of price discrimination. And electric firms induced large manufacturing firms to abandon steam engines and to turn to electric power. Extensive enlargements of gas service, too, followed from the use of block-price schedules or similar schedules. Discriminatory pricing also hastened the adoption of technological changes. This effect was illustrated in Figures 24 and 25.

Differentiation between large and small buyers shows no regard for differences in buyers' incomes. This kind of price differentiation, like class pricing, is not treated as a problem in distributive justice, as a problem about the service distribution and the relative consumer expenditures. Before their consumption of service is extended into the lower blocks of a schedule, most domestic buyers of electricity must own appliances. If they own electric refrigerators, consumers can buy some service in the second blocks of most electric-company schedules. And if they own electric stoves, they buy some service at the third-block prices of the schedules. Similarly, the consumption of gas or water at low block prices is dependent on the ownership of appliances. These appliances are expensive; a family can invest a sizable sum of money in a few electric, gas, and water appliances.[13] Since the purchases of appliances require large expenditures, the family investment in them is controlled by the family's income.[14] Thus the wealthy and high-income families can afford all the appliances they want; and they can extend their consumption into the lower price blocks of electric, gas, or water-rate schedules. The middle-income class of families can purchase some appliances, and probably extend their consumption beyond the first blocks of the schedules. The buyers with the lowest living standards are charged higher average prices than any other customers.[15] And if the company collects a service charge from all buyers, the families with low incomes are hit even harder by price differentiation.

Demand-price differentiation between industrial buyers is not based on income differences. It is based, as described previously, on the buyers' elasticities for utility service—on the alternative costs of utility-company service. The large industrial buyer of electricity apparently can produce his own service more cheaply than is true of the small industrialist. Consequently the industrial price schedule is scaled so that the large customer purchases electricity at a lower average price than that granted to the smaller manufacturing firm. Like their pricing practices in general, electric and gas companies fix their industrial rate schedules to "get the business." They are interested in revenue and earnings. Being concerned with their own earnings, utility companies disregard the effects of their industrial price discrimination on the cost, price, and general competitive relations of the large and small industrial firms. When the electricity cost is an important part of manufacturing costs, discriminatory electric rates allow the large industrial firms to become more dominant. Discriminatory electric or gas prices can endanger the survival of some small manufacturers. Yet the electric and gas companies do not care how the large manufacturers use their price advantages.

Revision of Schedules. Although the companies are not interested in the social effects of their price discrimination, the commissions should be. Being responsible for the public policy of utility operations, the commissions should have an interest in the high block prices that the companies charge to low-income buyers. And they can take an interest, too, in the price discrimination against small industrial buyers. A general reorganization of all price schedules is not necessary. Like the earlier proposal for class-price revisions, price schedules can be revised gradually: they can be changed in conjunction with earnings regulation. When the earnings of a company are reduced, the initial block prices for domestic, commercial, and industrial customers can be reduced. And earnings reductions can be used to eliminate the service charges and minimum bills. Proceeding in this manner, the commission starts a movement toward uniform prices for service. When the earnings are reduced, most companies and many commissions prefer to reduce the prices of the second, third, and fourth blocks of service. This is the best way to expand total consumption, but it is not the way to reduce the expenditures of poor consumers and small manufacturers. As they order price changes, commissions should be conscious of their choice between more service consumption and less discriminatory pricing.

When the earnings of utility companies are increased, discriminatory pricing can be moderated by increasing the low block prices. The prices must be increased, of course, where the buyers are willing to spend more for service. Prices must be increased where the demand is inelastic. Consequently the low block prices can be increased only if the consumers have inelastic demands for the lower blocks of service. Although the demand for electricity for refrigeration, cooking, and general appliance uses was elastic in previous years or before the appliances were purchased, it seems to be inelastic now. If buyers are firmly attached to the appliances, the demand probably is inelastic. If so, commissions can increase the prices of services for which customers now enjoy the low-price side of discriminatory pricing. But this kind of price schedule revision is not always possible for all consumers. Large industrial buyers still may have an elastic demand for utility-company service. Perhaps they still can afford to build their own plants or to turn to other fuels after the prices of utility-company services are increased. Sometimes, therefore, the increases in industrial prices must be confined to the initial blocks and must fall most heavily on the small industrial customers.

Chapter 29

Municipal Utility Systems

FOLLOWING THE old liberal tradition that was based on private property and private management, our legislators in the nineteenth century and the first third of the twentieth century steadfastly left the development of industry and exploitation of resources to individuals and corporations. Our creed of economic and social organization required faith in private enterprise; and competition of sellers was supposed to control prices and selling practices so that consumers were protected automatically against exploitation. But there was too little competition between utility companies to save consumers from exploitive pricing. Among these companies the competitive rule was abandoned: the public-interest concept became the legal rationale for public control, and the regulatory commission was introduced. That solution did not completely forsake the liberal tradition, for private production of utility services persisted.

The regulatory solution of buyer-seller conflicts was not universally accepted. Some public officials and many consumers thought that public ownership of utility plants was a superior solution. This thinking was challenged, of course, by the entrenched private companies. And the public-ownership controversy developed. This controversy was confined, for the most part, to the electric industry; municipal ownership vs. private ownership was the debatable, the unsettled, the partisan issue in the early years of the electric industry, in the years before the federal government became an important producer of electricity and made a more formidable challenge to the private companies. Arguing zealously, some persons had reasons for municipal utility plants: commission regulation was ineffective, consumers were exploited, municipal production was more economical than private production. On the other side, the private companies presented another set of claims: they praised the low prices and technical progress of their own service, and criticized the outmoded equipment, managerial inefficiency, and nontaxable condition of municipal plants. Each side looked at the operations of established municipal plants; and each partisan group saw only what it wished to see. Over the years, then, the municipal-ownership issue was a bitter, confused controversy out of which not much objective reasoning ever came.

Anyone who scrutinizes public ownership today and makes critical comments about it is still likely to be branded an opponent of public production of utility services. The pure partisans of public ownership are sensitive people who commonly like only unreserved, wholehearted adherents to their "cause." I reserve the right to examine critically the behavior of public plants and their managers; for this reason I am not a thoroughly devoted follower, but I am definitely not opposed to municipal or federal ownership of utility plants. Under the same production conditions I am inclined, indeed, to prefer public ownership and management.* According to my social values (as I said in the preface) the idea of public production of utility services is all right, though I do not yet see evidence that public plants always are superior in technical and social achievements to regulated private plants. But a record of personal views or polemical discussion is not the reason for this and other chapters on public production; the reason is study and understanding of public ownership as it is practiced in this country.

INDUSTRIES WITH LITTLE MUNICIPAL OWNERSHIP

This chapter is concerned primarily with the historical American movement of municipal ownership—the small and large, the accepted and controversial developments. Unlike the European and even the Canadian telephone systems, the American telephone industry has an insignificant amount of public ownership. European governments, conscious of the military as well as the general social importance of integrated communication services, often own and operate their telephone systems. And in Canada there are numerous municipal telephone systems as well as large provincially owned systems in Manitoba, Alberta, and Saskatchewan. But in the United States the public production of telephone service is confined to five municipal plants, the largest of which is located in a city of less than six thousand inhabitants.[1] Threats of public ownership do not trouble the Bell system.

Gas Plants. When gas was used chiefly for home, commercial, and street-lighting purposes, a number of municipally owned plants were constructed. In many small towns these plants apparently were built by the local governments, because private investors were not attracted to such small, unpromising businesses. After electric lighting was substituted for gas lighting, many of the small municipal gas plants were abandoned. In 1942 only 135 towns and cities had municipal gas plants.[2] Among the large cities only Omaha and Memphis own gas systems. Contrasted with electric and telephone service since the First World War, a gas-manufacturing plant generally is confined to a single city or urban area. Except in metropolitan areas the intercity transmission of manufactured gas is uncommon. But even the local character of gas production and distribution is not conducive to public ownership. Perhaps local authorities and the protagonists of municipal ownership do not consider gas service so indispensable to urban life as electric and water service. Or perhaps they do not want municipal ownership of gas plants because the gas industry is technically mature, and does not afford prospects of large future rate reductions. At any rate, the gas industry is rarely disturbed by municipal-ownership controversies.

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* Given the same managerial ability, about the same technical conditions of operation, and approximately the same prospects of economical production and pricing for public plants as for private firms, I have a preference for public ownership. My personal choice, which I try to keep out of the reasoning and writing, is favorable to public plants.

Urban Transport. Before 1920 a common question of local politics was municipal ownership of street railway systems. Judged by their discussion of municipal ownership and their strong opposition to private traction interests, many urban people hoped to have public transportation systems. Like many citizens, local politicians thought municipal ownership was the best solution for urban transit problems—the only way to rid the cities of the acquisitive traction "barons," to solve the troublesome problems of franchise regulation, and to turn the real or imaginary profits of transportation into lower fares. But a public traction system could be proposed more easily than it could be realized. Political leaders needed time to stir up a public interest in municipal transportation service, and to build a case that could withstand any attack of the private transportation managers and investors. Sometimes they were compelled to tear apart the political connections of the traction companies. Before 1900 the Yerkes interests in Chicago, for instance, could block municipal ownership of transit lines because they dominated local political affairs.[3] Public ownership could not be realized, moreover, until elections on the property purchase and bond sales were held. And negotiations about the purchase price always delayed municipal ownership—even prevented it altogether when the city and the company could not agree on a price. Many years often intervened between the proposal and the realization of public ownership. For instance, municipal ownership of the Detroit street railways was proposed, discussed, and negotiated for twenty-five years before it was achieved.[4]

Municipal railway and bus systems are uncommon today. Less than thirty cities own and manage part or all of their surface transportation systems. Most of the municipal bus and street railway service is performed in three large cities—in Detroit, Seattle, and San Francisco. Public ownership began in Seattle and Detroit in 1919 and 1923 respectively; and after the municipal system and a private company shared the San Francisco market for many years, the city bought the private system in 1945.[5] Controversies about public ownership of urban transportation systems rarely arise today. The prosperous days of the industry and the public hatred of private transportation companies are gone. After automobiles were widely used and the demand for street railway service decreased, the interest in municipal ownership declined. The interest in municipal ownership apparently depended on high transit-company profits. Even if the street railway and bus systems were unprofitable, city governments still could justify municipal transportation undertakings. They could take over unprofitable transit lines and try to maintain the services. But preservation of utility service did not seem important in the new days of auto transportation. After the street railway business became unprofitable, city governments lost much of their interest in public transportation systems and accepted abandonment or contraction of the private operations.

Places for Public Corporations. A metropolitan area often needs integration of the transportation services that are performed by street railways, busses, elevated lines, subways, and suburban railways. This integration can be a part of urban planning. Integration of schedules and free transfers between different transportation lines speeds up the movement of riders; when duplicate routes and services are eliminated, transportation costs are reduced and streets are less congested; and each transportation service can be devoted to its best use (busses on some routes, streetcars on other routes, and so on) so that the use of transportation resources is economized. A city gains from an integration of transportation services, but a metropolitan area gains even more. A single transportation system can certainly accelerate and economize service between the related cities of an area. If the business and social life of a metropolitan area are integrated, then the transportation facilities of the area should be lumped together. This is not a place for a municipal transit system; metropolitan rather than municipal integration of service is the problem. This is a place for a public corporation. Such a public corporation is used to unify transportation service in the London metropolitan area.

Before 1933 five railway companies, seventeen tramway companies, and sixty-one bus companies operated in the London area. The London Passenger Transport Board was organized to integrate the service of these numerous scattered transit systems.[6] It took over all the public transportation systems except taxicabs and steam railways, and in 1933 began unified operations that radiated twenty-five to thirty miles from Charing Cross. The Board exchanged its own securities for the securities and properties of the acquired companies. This is not public ownership as Americans understand it. The London Passenger Transport Board, like the British Broadcasting Corporation and the Central Electricity Board, is a public corporation. Management is vested in a board of directors of seven members who are chosen by the "appointing trustees." Because the trustees are drawn from designated business, legal, accounting, and government organizations, the directors are not really responsible to any government. Like the management of the Board, the financing is independent of general governmental affairs, though the treasury guarantees the principal and interest of some of the Board's securities. And the Board controls rates, which are subject to review by the Railway Rates Tribunal, and the introduction of new transportation services in the whole London area.*

Public corporations can be used to unify the transportation systems in American metropolitan areas. Different kinds of urban transportation service are available in all metropolitan areas, and separate bus and street railway systems often operate in each of the adjacent cities. But metropolitan unification of transportation service has not been accomplished anywhere. Consolidation of transit lines in New York City has not yet been effected, even though the integration problem has been pending at least since 1920.[8] A public corporation, for example, can be used to unify transportation facilities in the Chicago metropolitan area.[9] Separate bus, street railway, and elevated lines operate within Chicago; other bus and street railway systems provide service in various suburban areas; and steam, electric suburban, and elevated companies serve both suburban areas and Chicago. No strong movement is under way to bring these services under common management, to treat the Chicago area as a unit for transportation purposes. The voters of Chicago have approved a unification ordinance. Yet even the consolidation of the street railway, bus, and elevated systems within Chicago alone has been held up by disagreements between political and investor interests.[10] The owners of the transportation systems naturally have placed earnings above all else in the unification plans; local governments have been interested first in their own cities and transportation fares; and only a few organizations or individuals have given attention to metropolitan planning and have pressed the case of an integrated transportation service. The narrow views of local governments and the traditional respect for private investments have prevented metropolitan unifications of transportation facilities.

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* In 1921 the Toronto Transportation Commission, consisting of three members who were appointed by the Toronto City Council, was established and was authorized to integrate the service of the privately and municipally owned transit lines.[7]

WATER SERVICE

Municipal ownership of plants is predominant in the water industry. In 1946 more than 70 per cent of the cities over a 5,000 population provided water service, and apparently a larger percentage of smaller towns owned their water systems.[11] There are several reasons why public ownership is common in the water industry.[12] A single city usually is the optimum market area for a water system and, consequently, a city government can realize the customary technical economies of water-service production. But this is not always true. Sometimes a whole metropolitan area is the economical area for water service. Several adjacent cities, lacking adequate local supplies of water, sometimes are compelled to develop a distant source of water. For instance, the cities of the Los Angeles area, experiencing a rapid population growth and forced to find more water, organized the Metropolitan Water District of Southern California.[13] This public corporation built a long and expensive aqueduct to the Colorado River. The federal government financed the aqueduct; bonds of the Metropolitan Water District were sold to the Reconstruction Finance Corporation. Joining together, the several cities could economize the water-plant investment. Since all the cities had to look beyond the coastal area for additional water, a single aqueduct obviously was more economical than a separate aqueduct for each city. The need for a unified development of a water supply was inescapable in the Los Angeles area.

As a further reason for municipal ownership, water service is closely related to a city government's interest in the public health, fire protection, and population growth. Being responsible for the public health, a city may not be willing to trust a private company with prevention of epidemics that are associated with the water supply. Likewise, a city government wants to be sure that the water supply is ample for fire protection. If the city builds and operates the water plant, it can plan definitely for fire protection and not be reliant on a private company that is interested primarily in water prices and earnings rather than the fire hazard. And when a city is growing, the water plant and water mains should be expanded as fast as the population increases. The water plant should be expanded, indeed, somewhat ahead of population growth so that extensions of water service are not long delayed. A local government, anxious to see its city grow, is likely to enlarge the water plant more rapidly than is done by a private company. Some municipal plants, built at a time when the officials of so many cities envisaged unending population growths, still have excess capacities.

Private investors apparently are not so anxious to invest in water systems as in electric, gas, and telephone plants. A private water company has the customary responsibilities of a utility firm, and in addition it is obligated to provide plant capacity for an expanding population. A water company can be confronted with increasing costs of operation as it expands. When a city is small, deep wells or a near-by river can provide a sufficient supply of water. As the city grows and as larger quantities of water are demanded by the populace, the firm must build long aqueducts to distant rivers or lakes. If the unit costs of an expanding water system are increasing, the private company wants higher and higher water prices as it expands. But while a city government wants more water, it also may try to prevent increases in water prices, ignoring the connection between higher prices and additional investments in the water plant. As a further fact, the responsibility for fire protection is not always attractive to the private investors. They are willing to provide this extra plant capacity when the city promises to pay reasonable hydrant rentals. They want a return on the extra plant capacity that is equivalent at least to the return that they can obtain elsewhere. Cities, on the contrary, may want to press down the hydrant rentals, believing that reductions of the rentals are rightful compensation for franchise privileges.

A large water system is not always an attractive place for private investments. But private investors are rarely attracted to small water plants. Villages and small cities frequently have no choice between private and public ownership of their water plants. Most of the villages and small towns build their water systems; or they do not have central water plants. Many municipal water systems of this country are located in towns that have a few hundred inhabitants. Most of these plants incur deficits year after year; and the voters of many towns apparently expected the deficits when they approved the undertakings. Yet the people of the villages receive something more than a convenient service from their water plants. They receive lower fire insurance premiums, and safeguards for the public health. In these towns the water-system deficits are treated, like the costs of police protection or street maintenance, as a general cost of city governments.

ELECTRIC SERVICE

A few large cities have their own electric plants. Outside the territory of the Tennessee Valley Authority, where municipal electric plants are found in both large and small cities, three of the best known municipal plants are located in Seattle and Tacoma, Washington, and in Los Angeles.[14] Elsewhere the municipal electric plant is predominantly a small-town phenomenon. Nebraska, Kansas, Iowa, Minnesota, and Ohio are states that have more than a hundred of these electric plants;

most of them are located in villages. The heaviest concentration of municipal electric plants is in the upper Mississippi Valley.[15] On the other hand, some of the states of the East, old South, and Rocky Mountain areas contain only a few municipal electric plants.

The Early Period. Prior to the First World War the number of municipal electric plants increased steadily, though private ownership of electric plants always was predominant. These were the days when a single city was the optimum market area for electric service. The isolated electric plant was a common characteristic of the industry. A town could realize all the available technical economies of production; it could produce electricity as cheaply as a private company could. These were the days, too, when many towns built their electric plants because private investors did not want to invest in the plants. In many small towns the city governments had choices between municipal electric service or no electric service, just as these towns still must choose between municipal water service and no central water service. According to one study about 60 per cent of the municipal electric plants were started before the First World War because private investments were not available.[16] Trying to get some of the "big" city conveniences, small towns built electric plants and accepted the probable deficits of public operations.

Some of the large municipal plants were started during this period. The outstanding Los Angeles, Seattle, and Tacoma plants were in operation before the First World War. A shortage of underground supplies of water compelled the city of Los Angeles to go to the distant Owens Valley for a larger water supply; then the city entered the electricity business because it could produce electricity in connection with its water reservoirs.[17] Within a short time after it started to sell electricity in 1916, the city of Los Angeles exhausted its aqueduct supply of electricity, built steam-generating plants, and even bought electricity from private companies. The Los Angeles and Seattle plants illustrated another characteristic of some municipal-ownership ventures during this era: they shared electricity markets with private companies. In Los Angeles a private plant shared the market with the municipal system until it was acquired by the city in 1937. And the municipal plant and a private company still sell electricity in Seattle.

The Twenties. Between 1920 and 1930 many changes occurred in the municipal ownership of electric plants. During this decade the municipal production and distribution of electricity reached a peak and then declined so rapidly that, toward the end of the decade, some people prematurely anticipated the death of the public-ownership movement in the electric industry. The number of municipal electric plants was largest in 1923, when 3,066 cities owned and operated electric systems.[18] During the next seven years, particularly between 1925 and 1930, many towns and cities sold their plants to private companies or abandoned operations. By 1930 less than 2,000 plants were in operation.[19] Within seven years the number of municipal electric plants decreased about 35 per cent.

This decline of municipal electric plants was mainly a result of two conditions: holding-company finance, and technical changes in the production and transmission of electricity. During the twenties the utility holding companies often had good credit standings, because only a few persons believed that most of them were marked by reckless financing. Able to borrow cheaply and easily, holding companies offered the cities excessive prices for their municipal plants. Sometimes the competitive bidding of rival holding companies drove up the price of an obsolete municipal plant to an extraordinary figure. When a city had a choice between either an exorbitant price for a worn-out plant or reconstruction of the municipal system, it often sold the plant and accepted private production of electric service. And the cities also were attracted to the high quality of private electric service; the companies could promise service throughout each day, and fewer interruptions.

Holding-company finance and high prices for municipal plants were important reasons, particularly between 1925 and 1929, for the decline of municipal ownership of electric plants. But technological changes in the generation and transmission of electricity were more basic reasons for the decline. Between 1900 and the First World War the technology of electricity production and distribution changed rapidly; obsolescence was the dominant cause of electric plant depreciation. A succession of improvements in steam turbines, boilers, and other generating equipment greatly reduced the production costs of electricity. The optimum central station grew larger and larger. At the same time new techniques of electricity transmission were developed; even before the First World War the private companies could transmit electricity economically between cities. The small-scale steam or gas engines, which were used in many municipal plants, became obsolete except in sparsely settled areas.[20] By 1915 the experiences of some private companies showed that a group of small and scattered towns could be served economically from a single generating station. The municipal electric plant lost its isolated position, and came into contact with large-scale, private production of electricity. A private firm could afford to pay high prices for a local system, abandon the outmoded generating plant, and serve the community and adjacent communities from a central station.

The electric generating plants of some municipalities were outmoded even before 1920. These plants often broke down, did not provide 24-hour service, and could not produce electricity so cheaply as the private companies could. Yet, even though the private plants often were more efficient than the municipal plants, the villages and small cities did not have to abandon public service completely. They could become distributors of electricity rather than both producers and distributors. They could abandon their generating plants, and purchase electricity from private companies as transmission lines were extended from the central stations. As the impact of technical innovations was felt widely after about 1915, many local governments did abandon their generating plants and became distributors of electricity. After 1925 the municipal distribution systems were more numerous than the systems that generated and distributed electricity.[21]

Before 1930 nearly all the municipal distribution systems obtained their electricity from private companies, but commissions usually did not regulate the wholesale prices that the local governments paid for electricity. The bargaining of the cities and companies commonly determined the wholesale prices. An upper limit of the wholesale price was evident: a company could not charge more than the municipal cost of electricity generation. Threatening to build a generating plant, a city could prevent a higher charge. The city did not want to be held, however, to such an alternative cost measure of the electricity price; it wanted to share the central station economies of electric service. But the bargaining power of small towns was limited. Except where the state commissions intervened and reduced the wholesale prices of electricity, most private companies apparently exploited the bargaining weaknesses of municipal distribution plants.

Recent Developments. In 1932 only 1,802 municipal electric plants were in operation.[22] About this time a rejuvenation of the municipal-ownership movement began. Three conditions stimulated an interest in more public ownership of electric plants: electric rates did not decline much during the depression, the federal government provided funds for the construction of municipal plants, and regional projects such as TVA afforded low-cost sources of electricity. Between 1933 and the war many cities contemplated municipal ownership; between 1934 and 1939 about five hundred local elections were held on municipal-ownership proposals.[23] By 1939 the country had 2,102 municipal plants. Although this growth of public electric plants was interrupted by the Second World War, more local governments will sell electricity. In particular more municipal distribution systems will be acquired or built. These will increase more than municipal generation and distribution systems for an obvious reason: this is one way to sell the public power of the Columbia River, Shasta, TVA, Missouri Valley, and many other federal projects.

The disappointing performance of many state commissions revived the public interest in municipal electric systems. Consumer incomes and the prices of many commodities collapsed during the early thirties; but only modest reductions or no reductions at all were effected in the electricity prices. These were times when buyers wanted lower utility prices as they never wanted them in the prosperous twenties. Consumers blamed the commissions for what they thought were exploitive electricity prices; and they listened more attentively to the municipal-ownership partisans, ignoring the obvious fact that municipal electric rates, too, did not decrease so much as the general price level decreased. Many consumers thought that the regulatory procedures protected the earnings of private companies, and failed to put the inflated capital structures through reorganization wringers. Sometimes these complaints against commission control were justified, for commissioners lacked funds to hire expert staffs and to undertake frequent investigations, and rarely showed any interest in new means or ends of earnings and price control, or were compelled by the Supreme Court to allow generous valuations and returns for private properties.

Improvements of the Diesel (oil) engine also encouraged the construction of municipal generating plants. When Diesel power was used during the thirties, electricity could be produced for about 1½ cents a kilowatt-hour in a town with 5,000 inhabitants.[24] An improved Diesel plant afforded economies of small-scale production of electricity. It was beneficial, chiefly, to small towns, the places where the private company rates were highest. Not only the improvements of the Diesel engine and the high electric rates of private companies, but also the selling practices of the Diesel engine manufacturers influenced the expansion of municipal ownership. Diesel engine manufacturers sent salesmen to the villages and small cities where they described or even exaggerated the economies of public ownership. The manufacturer did not require cash payments for Diesel engines. Instead, he sold equipment with conditional sales contracts, allowing the cities to pay for plants out of their electricity revenues.

Federal Government Influences. The grants and loans of the Public Works Administration facilitated the construction of many municipal electric plants. A local government received an outright grant of 30 or 45 per cent—usually 45 per cent—of the electric plant cost. This part of the funds was spent on labor and materials; the Public Works Administration, being concerned with the re-employment of laborers, specified the kinds of labor and the wage rates. And the Public Works Administration loaned cities the remainder of the electric plant investments at low interest rates. PWA loans, which were repayable over long time periods, saved the cities the more difficult and more expensive public sales of bonds. Between 1933 and the Second World War more than a hundred PWA allotments were made for the construction of municipal electric plants. Even if private systems already occupied the markets, the PWA made grants and loans for the public plants. Challenged by the PWA program, the private companies fought back and tied up many municipal undertakings in litigation. They combated federal sponsorship of municipal electric plants as vigorously as they ever tried to thwart any challenge to their market control and their earnings.

An even greater federal government stimulus to municipal ownership came with the construction of large, regional power projects.* Local governments could buy electricity more cheaply from these large public plants than from private companies. Purchasing their electricity from the regional public plants, they were certain to realize the economies of large-scale production of electricity for two reasons. Creation of public distribution systems was a basic rule of the national power policy. Not only were low wholesale rates available to municipalities, but also the regional projects sometimes arranged for the acquisition of the existing private systems. The Tennessee Valley Authority, for instance, purchased the entire plants of several private electric companies. The Authority kept the generating and transmission facilities, and sold the distribution systems to towns and cities. More of this kind of municipal ownership will occur; the existing regional projects will extend their market areas, and more regional projects will be constructed. But the expansion of this kind of public ownership naturally will be confined to the geographic areas of regional projects where flood control is needed, where irrigation projects are feasible, and where hydroelectric sites are available.

When holding-company systems were broken up or reorganized by the Securities and Exchange Commission, the federal government indirectly affected the municipal ownership of electric plants. The SEC was authorized to limit each holding company to a single integrated system, or to an integrated combination of principal and additional systems. Making a strict interpretation of the law and seeking localized management and coordinated operating properties, the commission confined each holding company to one area. The companies were limited to economical, interconnected systems. To meet the integration requirements, the companies sometimes sold operating properties to the highest bidders. Some municipalities took advantage of these opportunities and bought distribution systems or both distribution and generating equipment.[25] They bought plants that the private companies refused to sell beforehand.

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* The relations of municipal plants and regional power systems are discussed in later chapters, particularly Chap. 34.

SOME CONDITIONS OF MUNICIPAL OWNERSHIP

The movement of municipal ownership, as described up to this point, shows how the technical achievements and social behavior of private companies influence the expansion of public production. Operated commonly by skillful technicians, the private firms can produce economically and thereby discourage planning for municipal production. Controlled by acquisitive men who naturally do not want to lose profitable markets, the firms combat every step toward municipal ownership today in the electric industry and once were equally vigorous in the traction business. Facing the social opposition and technical competence of private enterprises, a municipal-ownership proposal really needs the spirited leadership of partisans who can move voters to see the ugly side of private management and money-making, are not quieted by the technical achievements of private management, and look hopefully into the future. There are other conditions, too, of municipal ownership that are not mentioned in the earlier parts of this chapter.* These conditions, mainly legal considerations about franchises, acquisitions of private plants, and debt limits of local governments, are discussed in this section.

Legal Right of Municipal Ownership. This is a basic legal question: can a city build and operate a utility plant when a private company already occupies the market? In some states the answer depends altogether on the terms of the company's franchise. If the company holds an exclusive franchise, the city can wait until the franchise expires, or it can use the right of eminent domain and make a condemnation purchase of the private plant. As long as the exclusive franchise is in force, the city cannot build a new plant and compete with the private firm. And the company, which wants to get the highest possible price for its property, can protract the condemnation proceedings. In the end the condemnation price may be no bargain for the city. Troubled by litigation or compelled to pay a high price, a local government usually does not undertake utility operations until the exclusive franchise expires. Even if this does not happen for a long time, the city still may put off municipal ownership of the utility plant.

Cities usually prefer nonexclusive franchises. Such a franchise, like any other franchise, allows the company to sell service for a certain time period in a certain market. But the company is not assured exclusive control of the market. Granting a nonexclusive franchise, the city can issue another franchise to a second private company or it can build and operate a municipal plant. To avoid the construction of an extra plant, the city can buy the private system at a price that is fixed in some states by bargaining. Such a property exchange is not always easy to negotiate.[27] As the bargaining proceeds between the company and city, the hearings are drawn out, much conflicting evidence can be introduced and the city officials may grow so weary of the bargaining that they start condemnation proceedings. Or the city government, harried by a recalcitrant private firm, may undertake the construction of a duplicate system. Even though the private company loses property values, the courts do not protect a company against a duplicate plant and competition when the franchise does not give exclusive market rights. One case, involving the construction of a municipal plant with PWA funds, reached the Supreme Court.[28] The company argued that the municipal plant was an illegal undertaking, because it was financed with federal funds and endangered the private property values. But the Supreme Court, ignoring the argument of the company against federal financial assistance, simply said that the local government had a right to build the plant under Alabama law and under the terms of the nonexclusive franchise.

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* The Supreme Court does not directly limit the establishment of municipal utility plants. It does not protect private companies against the entrance of municipal systems,[26] choosing a simple legal solution of the problem, the Court says the competition between private and public plants is a risk that private firms take as they enter the utility industries.

Even though a city feels compelled to build a duplicate plant, it prefers exclusive control of the market. In nearly all markets a single plant is more economical than two plants. When a local government duplicates a private plant, resources are wasted just as much as when a second private plant is built. And a duplication of the private plant is conducive to sharp price competition.* Even if they do not engage in price competition, the company and city may not be able to avoid deficits; they spoil each other's opportunities for reasonable earnings. When local governments want to simplify property negotiations and reduce the chance of plant duplications, the nonexclusive franchise specifies a price at which the city can buy the private plant. But this provision does not settle the matter. The city is not obligated to buy the plant. Municipal officials, indeed, may not want the whole private plant; perhaps they do not want an electric generating plant (except for stand-by use), because electricity can be purchased from a large public organization such as the Tennessee Valley Authority. Even when a city plans to generate its own electricity, it wants a modern plant which contains recent technical improvements, rather than a partially obsolete (or excessive) private plant.

In some states, however, municipalities cannot choose freely between the duplication and the purchase of private company plants. Commission regulation of private company prices is a firmly fixed policy in these states; competition of utility enterprises is not an acceptable policy. According to some state laws a city must obtain the permission of the state commission before it operates a municipal plant in a market that is served by a private company.[30] In other states—Massachusetts, New Hampshire, Connecticut, Florida, and Arizona—the city must purchase the plant of the private company.[31] Such a purchase requirement, which protects the companies and limits the expansion of municipal ownership, has been in force ever since 1891 in Massachusetts.[32] Indeterminate permits, which are notable in Wisconsin regulation, require municipal purchases of private plants at prices that are fixed by the state commission. As a further fact of indeterminant permits, a city cannot commence utility operations until the private firm operates inefficiently.* Inefficient private service must be proved by the municipal officials. A convincing case of inefficient private service is difficult to present, because the technical proficiency of private electric companies usually is unchallengeable. Consumers and cities often object to utility-company prices. But excessive earnings and prices are not reasons for revocation of indeterminate permits; they are reasons for commission regulation. An indeterminate permit, as its critics allege, can be a permanent permit.

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* Sometimes when a municipal plant enters a market, the private company is not allowed to reduce prices; the company cannot engage in price competition with public plants.[29]

The Regulated Purchase Price. If a commission fixes the purchase price, a company does not get the same price that it does with open bargaining. Since some commissions are more interested than the city governments in property values and future private investments, the commission price can be higher than the bargained price. Sometimes the method of purchase-price determination is specified in a statute, though the statutes usually say simply that the price must be "just and reasonable." To determine the purchase price, commissions usually want to ascertain the reasonable value of used and useful property. The purchase price and the property value for earnings regulation often are alike, or they are computed in the same general way. Consideration also is given to severance damages—the effect of the property sale on the whole property value. Consequently, a local government may be forced to pay for the transmission lines that bring electricity to the town; even some investments in the general plant capacity can be counted among the severance damages. The city may be compelled to take all of the local plant, even if it wants to use only part of the private system. As a further fact the commission may allow the company something for going value.[34] And the

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* Even in the absence of an indeterminate permit, a state commission sometimes tries to prevent the ousting of a private company after the franchise expires. In the Geneseo cases the Illinois Commission claimed control over the entrance and withdrawal of a private firm, and ordered the company to render service as long as it held a certificate of convenience and necessity. In the first case the Illinois Supreme Court accepted the commission's reasoning; but in a later case the court held that the city could oust the company.[33]

California Commission says, "The actual present earnings . . . should not be disregarded."[35] Capitalization of existing earnings is an investor's measure of plant value, and is not attractive to a municipality that wants to sell low-priced service. The municipality undertakes public production of utility service because it believes that the private earnings are excessive. Consequently when a purchase price is based on a capitalization of earnings, some of the city's opportunities for price reductions are lost.

Debt Limits. In about three-quarters of the states the statutes or constitutions specify debt limits for municipalities.[36] The debt limit commonly is a fixed percentage of the assessed valuation of the taxable property that is located within the city. A common maximum, except for special exemptions, is 6 per cent of the assessed property valuation. For some cities these debt limits prevent municipal ownership of utility plants, though most of them still are free to borrow. Most towns and cities are not up to their legal debt limits, and do not have burdensome amounts of indebtedness.[37] But they do face another limitation of public investments: voters must approve the new bond issues of most municipalities. This often seems to be a greater restriction on municipal utility operations than the legal debt limits are. Some proposals for public ownership fail because the voters have a bias against indebtedness; and after a municipal plant is established, further expansion of the plant may be limited because the voters are unwilling to approve new debt issues.

To avoid debt limitations as municipal plants are built, a city can issue "revenue" bonds. These bonds, which were issued freely after 1930, are not counted among the official municipal debts and are not subject to voter approvals. A revenue bond is not part of the general indebtedness of a municipality; it is not controlled by statutory debt limits.[38] Contrasted with the general bonds of a city, a revenue bond, which can be issued with or without a mortgage, is amortized out of the revenue from the project. Electric revenue bonds, for instance, are amortized out of the city's revenue from electric service. The holder of a revenue bond cannot demand payment out of the general tax revenue of the municipality.

Revenue bonds are used to finance bridges, roads, and schools as well as to acquire or to build municipal utility plants.[39] More than forty states have revenue-bond statutes. The Public Works Administration encouraged much of the recent use of revenue bonds, because these facilitated investments in public works. During the thirties many municipal electric plants were financed with them; and expansion of old municipal water and electric plants often was financed in the same way. Local governments issued revenue bonds freely to the PWA, which wanted them. But revenue bonds can be sold more easily to the federal government than in the public bond markets. Unlike the financing by the PWA, the selling cost and interest rates can be quite high on small public issues of revenue bonds. In any case, these bonds, being secured by the earnings of proprietary ventures rather than all local government revenue, are likely to be sold at higher interest rates than the general municipal bonds.

The Elections. When the city officials submit their plans for municipal ownership to the voters, the established utility company does its best, of course, to defeat the proposal. The private firm tries to influence voters in many ways. A typical campaign includes newspaper, radio, and billboard advertising. Company employees form a speakers' bureau. And as the election approaches, these employees often make a house-to-house canvass of voters, ringing doorbells and arguing the company's case. Speeches and conversations on the increasing city indebtedness, the bureaucracy of government administration, the inefficiency and high rates of some municipal plants, and the city's inexperience in utility operations are certain to get a hearing from many voters. In addition a citizens' committee, composed of the business and professional men who do not like the "socialistic" proposal, is organized. The company even may "buy" the influence of persons who are able to control blocks of votes. Sometimes rate reductions are granted voluntarily before the election day. The small residential and commercial customers get most of these price reductions. The customary price differentiation is reversed. Faced with a real municipal-ownership threat, the firm gives the reductions to the buyer classes that have the most votes even if these buyers have inelastic demands for service.

THE CHOICE OF OWNERSHIP

Is municipal ownership and management of utility service economically and politically more desirable than private production and sale of the service? This is the primary social question of the municipal-ownership movement—of the unsettled controversy between private and public management. This is a persisting, perhaps an unanswerable question in the electric industry where the ownership conflict is fought more often and with far more feeling than in the water industry. Being unequivocal partisans, some people choose public or private service according to their preconceived feelings and attitudes. For one group public ownership is unquestionably the right way to perform utility service; for the other group, which is steeped in the private-enterprise tradition, public ownership is absolutely the wrong way. Being zealous reformers, the municipal-ownership enthusiasts anticipate lower rates and other social achievements as soon as their service starts; having faith in private management, their opponents are always ready to praise the efficiency of private production and to exaggerate the political manipulation and managerial clumsiness in public systems.

There is another approach to the ownership question: objective study of the motives, conditions of operation, and achievements of public and private systems. The methods and consequences of the conflicting managerial forms are compared. Use of technical innovations, competence of the managers, general consideration of private and social ends of production, limits of investments, acquisitiveness as shown in prices or service standards—these are some of the headings under which facts can be gathered and objectively examined. Gathering these facts and trying to understand their social significance, a student may be able to take the ownership problem out of the uncertain area of impressions and feelings. This is not the place to undertake a thorough examination of facts, but several possible evaluations are outlined in the remainder of the chapter.

Technical and Managerial Efficiency. Some municipal plants do not achieve so much technical efficiency as that of private firms. Municipal water systems, commonly serving single cities, can choose the most economical scales of poduction for their market areas; both the private and public systems have access to the same economies. But municipal electric plants, generating and distributing service in small towns, often do not realize the optimum economies of central-station production; such plants commonly are not so efficient as the large private ones. Other municipal plants have good opportunities for economical operation. Some of them, as in Los Angeles and Seattle, have large scales of production; others are located so that they can buy electricity cheaply and get the advantages of efficient production from TVA, Columbia Basin improvements, the Nebraska public. system, and other public projects.

Private firms may delay investments in technical changes because they do not anticipate profits—because either the cost, demand, or regulatory prospects are not attractive. Yet the historical record of innovations is long, even notable for many companies. While some public systems are quick to adopt new and more efficient means of production, others seem to be slow and often have much obsolete equipment. The changes may be delayed because political inertia affects the managers, or because borrowing (even borrowing with revenue bonds) is put off for one reason or another. And in the small towns, where the obsolescence of plants apparently is most common, the systems are not always managed by skilled engineers and the town officials often lack ability to formulate improvement and expansion plans.

Money-making Objectives. The management of public systems seems to be directed toward broad social purposes more than is true of private management. Acquisitiveness and money-making stand out in private business, and naturally have important effects on the amount and distribution of service. Liking profits and abhorring losses, private firms commonly do not develop social patterns of pricing and service distribution except as legislatures and regulatory commissions require them. Public systems, to be sure, do not disregard money-making; as described in the next chapter, profits are attractive to public managers, consumers can be exploited as large amounts of cash and free services are contributed to city governments, both depreciation charges and debt amortization charges may be counted among the costs of service, and customer classifications and differentiated price schedules are used particularly by electric systems. Yet the pursuit of profits, the commercialism, is less vigorously asserted among municipal systems. Operations are not abandoned or prices are not increased just because losses are incurred; in some towns the plants are built and maintained so that a social purpose such as public health or fire protection can be fully served; the enterprise is treated commonly as a community undertaking that is available to everyone regardless of marginal costs; and in general the community welfare is a real consideration of the public managers, even the clumsy and political-minded managers.

Rate Comparisons. In the electric industry a comparison of private and public rates commonly is considered important. Unfortunately a current and complete comparison is not available. The best comparison of private and municipal electric rates was made in the thirties by the Federal Power Commission.[40] Using the actual rate schedules of all systems, the commission computed the average consumer bills for municipal and private service according to (1) different sizes of towns, different states, and different regions,* (2) different amounts of consumption for domestic, commercial, and industrial buyers. These studies indicate several price advantages of municipal ownership over private ownership. In residential service the price advantage tends to increase as the size of the city and as the size of the electric plant increase.[42] This result is not a surprise to anyone who knows the diseconomies of small, isolated municipal plants.

The consumer bills for residential service are computed for 25, 100, and 250 kilowatt-hours. When the consumption is 25 kilowatt-hours a month, even the small municipal plants have moderate price advantages over the private companies. This is an indication that municipal plants make less use than private companies of demand differentiations and service charges. If the consumption is 100 kilowatt-hours a month, the price advantage of public plants is less common in small towns than for a monthly consumption of 25 kilowatt-hours; but in the large cities the municipal plants provide small price advantages for families that buy 100 kilowatt-hours a month. When a family's monthly electricity consumption rises to 250 kilowatt-hours, the residential buyers in small towns, except in the Pacific Coast region, pay more for municipal service than for private service. In the large cities, however, the average bill of large residential buyers is lower for municipal service than for private company service.

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* The Power Commission study gives the average bills for each community within each town-size group. Another comparison, whereby the town populations are used to weight the community electric bills, is the average bill for a consumer within each town-size group.[41]

The studies of the Power Commission show a general price advantage, too, for other kinds of municipal electric service. For both commercial and industrial service the average bills of consumers are lower in towns that have public plants. But comparisons of private and municipal rates are not so important for industrial service as for residential service. The commercial and industrial service is concentrated in the larger towns, in those that have more than 10,000 inhabitants. Most of the municipal electric plants are located, however, in towns with less than 2,500 inhabitants and serve primarily the residential and small-scale commercial customers.

These rate comparisons give general evidence of the price advantages of municipal ownership over private service. And if such comparisons were made with current prices that included the low-price effects of the TVA and other federal undertakings, the general price advantage of municipal ownership probably would be even more evident. The rate comparisons do not show, however, that the public service is cheaper under all conditions than private service.* And they do not distinguish between the different technical and locational conditions of municipal service. The electric plants in Los Angeles,[48] Seattle, and Tacoma prosper and can sell at low prices because they have economical sources of electricity and are well managed. Other villages and cities, as in the Tennessee Valley, can buy electricity cheaply from federal projects. But other towns are not so fortunate; they incur some diseconomies of generation, or must buy their electricity supplies from private companies. Nor do the comparisons deal with the costs (cash contributions, tax equivalents, or borrowing costs), public-minded management, and social purposes that distinguish municipal systems from private firms. Indeed, price comparisons oversimplify the distinctions between private and public production; they compare systems that are not managed toward exactly the same ends.

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* Since these price comparisons are made in terms of average bills for town-size groups, an obvious fact about them should not be overlooked: even if the average price is in favor of public ownership, some of the municipal systems in each town-size group have higher prices than those of some private companies.

Public Acceptance of Municipal Ownership. Municipal production of utility services, particularly in the water and electric industries, is well established and scarcely can be classed as an experiment or a temporary political deviation. It is here to stay. Local governments rarely sell their plants to private companies nowadays; the long, quite stable histories of many municipal plants are evidence of social satisfaction. For future developments the electric industry is the one to watch. While municipal ownership of transportation and gas systems may expand slowly and public water systems already are numerous, a notable growth of municipal electric service seems to be a reasonable prediction. The American people are not so strongly attached to private electric properties and their managers as they once were. And the social achievements of public production are more respected and seem to be better known than they were before 1930. Most of all, the expansion of federal river projects, providing low-cost sources of electricity, is likely to stimulate an expansion of municipal systems; experiences in the Tennessee Valley and elsewhere adequately demonstrate the conjunctive efficiency of federal production and municipal distribution of electricity.

Chapter 30

Pricing of Municipal Services

FOR MANY YEARS municipal management of utility services lacked perspective and distinctiveness. The main issue was a choice between municipal ownership and private ownership of utility plants. Protagonists of municipal ownership were forced to combat the American tradition of private property and private business every time a new municipal plant was established. In the water industry the struggle was mild, but in the electric industry it was sharp and the arguments were badly warped. Fighting not only to win support of private-minded citizens but also to defeat the entrenched private companies, the proponents of public ownership thought the main objective was establishment of a municipal plant. In a practical sense they were right; construction or purchase of a municipal plant came ahead of management of the plant. Yet even if it were a necessary prelude, a victory in the contest of municipal vs. private ownership was not enough. It did not assure a successful municipal system, a well-managed and socially distinctive utility service for a community. The public interest in a municipal-ownership undertaking always waned as soon as the municipal plant began to operate; municipal ownership of a utility plant was the primary issue, and municipal management of the same plant was the secondary problem. Distrusting private companies and regulatory commissions, the people approved public ownership; trusting the acumen and purposes of public officials, they had little interest in the price, service, accounting, and financial policies of municipal systems.

SEVERAL GENERAL CONDITIONS

Being managed by different kinds of organizations, municipal and private utility services are not exactly alike. A basic condition of municipal performance of utility services is the division of local government functions, particularly the division between proprietary functions and general government functions. Next, the market limits of municipal utility service are the boundaries of the city, except for occasional extensions to the surrounding suburban or rural areas. Third, a city cannot issue securities so easily as a private company can. Finally, the municipal utility plants vary widely in size, economies of operation, and managerial proficiency.

The Political-proprietary Division. Local governments never can separate completely their general political functions from their proprietary operations of utility plants. The general government of the city obviously is not the same thing as the production of utility service, but the two rarely are set apart from each other. A municipal utility plant is a part of the political organization of a city. Thinking of utility service as a technical matter rather than a political problem, we can say that municipal utility operations should be kept out of politics. The political leaders of the city may agree privately with this judgment. Yet, as they consider their own political existence, these officials cannot afford to keep their hands off the plants altogether. If the mayor and some councilmen came to office originally to establish the municipal plant, they still have personal interests in the plant. Both the new and old officials have political interests in municipal utility systems. They may choose wise policies and hire expert plant managers; or they may appoint political friends to the municipal plant jobs, take cash away from the systems, and otherwise demonstrate the inferiority of municipal management to private management. Even if they cannot provide intelligent control, local officials usually are determined to supervise their utility plants. Long after the plants start to operate, politicians feel that they are responsible for their financial, pricing, and output results. Working under these conditions, the managers of municipal systems and their staffs cannot escape entirely from the political life of the community.

Market Area Limits. A municipal utility plant commonly sells service within the city limits, and occasionally extends it to adjacent suburbs and rural areas. In some states a municipal plant cannot sell service beyond the city limits unless the extension is approved by the state legislature. And a few state commissions pass on each municipal service extension beyond the city limits. Even if the state commission or legislature does not restrict the area of service, the plants are planned primarily for service in one town or city. When the hub city in a metropolitan area acquires a transportation system, it does not extend service to all the surrounding suburbs, providing metropolitan integration of transportation service. Each city usually builds a separate water system. And a municipal electric plant usually is not designed as a central station from which surrounding cities can be served. Not only legal restrictions and investment costs but also the provincial nature of local governments restrict the market expansion of municipal plants. Local governments are interested in utility services for their own citizens.

A city usually is the optimum service area for a water system. But the optimum service area for electric service often extends beyond municipal limits. A private company, capable of large-scale generation of electricity, has access to economies of electricity production that are not available to all small-sized towns. If a town undertakes both the generation and distribution of electric service, it chooses municipal ownership for managerial or political reasons instead of technical reasons. The small cities and villages choose municipal electric service despite the diseconomies of small-scale production, despite the difficulties that they face as they try to effect sizable rate reductions. Looking for cost economies and rate reductions, the village or small city can best confine its operations to the distribution of electricity and buy a wholesale supply of electricity from a private company or public power project. When small towns can buy their electricity from such public projects as the Tennessee Valley Authority or Bonneville Dam or other large-scale projects, the local scope of operations usually does not limit the efficiency of the municipal plant.

Financial Hindrances. Controlling increases in municipal debts, voters can restrict the expansion or improvement of municipal utility systems. These debt controls affect large as well as small plants.[1] If the city officials want to finance a plant with general municipal bonds which can be repaid out of either tax revenue or utility service revenue, then the indebtedness must be approved at the polls. Although the plant managers know more about the capital needs of their systems than any other persons, they still must submit their investment plans to voters who usually have no expert understanding of the plant expansion or improvement. Many persons vote against a borrowing proposal because they simply dislike debts in any form. They do not study the need for more or better utility service, but they do have strong feelings about bond issues and taxes. To escape voter control of the investment plans, municipal authorities can issue revenue bonds which are repaid from utility service revenue rather than tax revenue. Or the investments also can be financed out of utility earnings; earnings can be used for plant replacements or improvements instead of rate reductions. Otherwise the managers of municipal utility service must allow the voters to reconsider the ownership controversy, to condemn or praise the municipal enterprise, to show aversion to indebtedness, and to use half-truths or no information at all as they vote on the debt issue.

Voter control of municipal plant investments has more justification for subsidized utility services than for self-supporting services. When the total revenue from a municipal utility service is less than the total cost of the service, the deficit is covered with tax revenue. To make up the deficit, the city either can increase the tax rate or it can forego some other municipal service such as public parks, maintenance of streets, education, or police protection. Some public authority must determine the balance between more utility service and higher tax rates. This is in accord with the democratic process of government; either the people or their elected representatives control tax rates and allocations of tax revenue. But when the municipal utility service is self-supporting now and is expected to be self-supporting in the future, a case for voter control of new plant investments is not so easy to build up. Tax rates are not affected by the municipal utility service. And no public service or public improvement is given up so that utility operations can be supported. If the public system is self-supporting, a new investment in the utility plant is a proprietary investment, not a general municipal investment. But such a distinction between subsidized and self-supporting services is not used by local governments. Neither voters nor public officials want to divide the general municipal debt according to its uses, separating each kind of proprietary indebtedness from the general, tax-supported debts.

Large and Small Plants. The size of municipal utility plants commonly affects the costs and prices of service. Many villages as well as large cities have municipal water plants. Municipal electric plants are located in towns with less than one thousand or even less than five hundred inhabitants, and they are located in cities as large as Los Angeles and Seattle. A small municipal plant does not always have higher production costs and higher prices than a large plant. A village can drill a deep well and get a water supply more cheaply than the large city that must build an aqueduct to a distant river or lake; all sizes of towns buy electricity at the same rate schedule from the TVA, Bonneville Dam, and other projects, and have similar or identical retail prices. But other small electric systems, particularly the systems that generate and distribute electricity, commonly have higher operating costs than the large systems. Nor are the pricing policies alike for the large and small plants. At least a common pricing pattern is not easily discerned; the large-system managers usually have more knowledge of cost behavior and financial problems, and more ability to choose wise price and service policies.

Quality of Management. The competence of plant management is another variable. Although political preferment in managerial appointments is not common,[2] a considerable amount of unskilled management certainly is found among municipal plants. The Los Angeles and Seattle electric plants, for instance, always seem to have well-known, able managers. To improve the performance of municipal service, the Tennessee

Valley Authority prescribes accounting systems, regulates retail prices, controls the uses of cash, and offers engineering assistance to its municipal distributors of electricity.* And the state-wide system of Nebraska electric plants, the Bonneville organization, and other public projects try to improve the management of the municipal distribution systems to which they sell electricity. But many small municipal water and electric plants are poorly managed. Engineering skill often is lacking in the planning and maintenance of the plants; poor accounting practices are common; and deficient knowledge of pricing policies is nearly universal. The small systems have a plausible excuse for managerial deficiencies: they cannot afford to pay high salaries.[3] In some small towns, in fact, the town marshal operates the municipal water system. And the mayors and city councils, even in fair-sized cities, lack ability to provide efficient management.

EARNINGS AND PRICES

Since one is a public enterprise and the other a private organization, municipal and private utility systems naturally have somewhat different service and earnings objectives. The public investments are controlled in the same way that the private investments are managed. Wanting utility service rather than profits, some cities and towns are willing to build their utility plants (particularly water systems at the present time) even if they incur deficits. And after a municipal system is in operation, unprofitable extensions may be made to the outskirts of the city so that the whole populace can consume the public service. Unlike the private companies, the municipal systems often have a policy of debt amortization rather than depreciation accounting; some city governments even count both debt payments and depreciation charges among the costs of municipal utility service. Although the municipal systems are not required to pay taxes, they frequently contribute free services and cash to the city governments. But a municipal system is not the antithesis of a private system, for there are times when municipalities search for more earnings nearly as vigorously as the private firms do. As a minimum, most city governments want self-liquidating production of utility services. There is often a close resemblance, too, between municipal and private prices; both of them classify buyers, and the municipal systems frequently copy the price-schedule forms of the private companies. Some city officials proudly say that their utility systems are managed in a "businesslike" manner.

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* These controls, which are distinctive parts of the TVA program of public ownership, are described in Chap. 34.

The Earnings Objective. In several ways the management of municipal utility operations shows greater attention to service and less to earnings than is shown by private managers. Some city governments invest in utility plants, even though the earnings are not expected to liquidate the investments. When private investors are unwilling to put their funds into utility plants, many small towns build their own systems. This was the reason for some early municipal undertakings in electricity production. And it still is the commonest reason for small municipal water systems. These water systems, built to secure fire protection and to safeguard the public health, provide service but do not increase municipal revenue. The cities use general tax revenue to cover the deficits in water revenue. Treating the water plant as a general improvement rather than a strictly proprietary undertaking, the small towns willingly amortize the water bonds out of general tax revenue. And most of them do not experiment with prices, and try to minimize the deficits.

Attention to the public welfare is reflected, too, in the output policies of municipal systems. A private company, to be sure, is required to serve everyone who wishes service within the area where the company holds itself out to serve. If the firm has the right to perform a utility service within a city, it usually is obligated to extend service lines to all persons who desire service in the community. This is not an absolute rule; companies are not always required to make extensions when an expected increment in revenue is smaller than the anticipated increment in costs. An obligation to serve everyone is unnecessary for many municipal plants. They are managed so that community-wide service is given. Treating the municipal plant as a community enterprise, the managers and the local government apparently do not try to restrict service to the most profitable margin of operations. Some of the consumers of water, electric, or bus service are located in the sparsely settled sections of the city where the cost increments exceed the increments in revenue. The municipal system brings service to some or all of these consumers. A city government serves both the high-cost and low-cost areas of operation. Bus lines go to the city limits and provide city-wide service; the city officials realize that the outlying families have as much need as other families for gas and electric service; and water is brought to everyone, because the public officials feel a responsibility for general fire protection and public health. The public need for utility services is a more important determinant of municipal than private limits of production.

Even if the managers of municipal utility plants are less acquisitive than those of private companies, they still are interested in earnings and dislike accounting deficits. Much of the "business mind" is evident in the management of these public enterprises. Management does not clearly put the objective of maximum service consumption ahead of financial success. It wants self-supporting enterprises. Even though they do not seek monopoly earnings, city officials usually believe in a cost-price relationship for the municipal operations. And the standard form of that relationship seems to be an equation of total revenue and total cost.* Perhaps the best cost-price relationship calls for slightly more total revenue than total cost so that a "cushion" of earnings is accumulated; then the financial success of the enterprise never is doubted. This does not mean that all municipal systems make profits. For some water systems, which are built to get service rather than earnings, an equation of total cost and total revenue is impossible. This is an exception to the standard rule. Deficits are not better than profits, though the towns sometimes must choose between deficits and no central water service. The success of municipal plants commonly seems to be measured by business standards: the self-supporting system is more successful than a plant that incurs accounting deficits. And successful businessmen sometimes are chosen to manage the municipal utility systems, because business ability is expected to produce improvements in the income statements.

Depreciation and Debt Amortization. Depreciation accounting is practiced irregularly by municipal utility systems. Disregarding plant depreciation as a cost of service, some systems do not charge any depreciation expense to operating expenses; others make occasional and meager provisions for depreciation expense; and some practice full-reserve accounting for depreciation just as private companies do, and clearly count depreciation expense as a cost of service. A further fact distinguishes the property accounting of municipal plants: sometimes they substitute debt amortization payments for depreciation charges. The periodic payments on the debt are not recorded as operating expenses, but the revenue of the plant is high enough (for a financially successful enterprise) to cover the debt payments. Choosing prices for service, the plant managers count debt amortization payments as costs of service, even if the payments are not recorded in the operating-expense accounts.

The substitution of debt payments for depreciation charges is a peculiarity of municipal plant accounting. City officials and plant managers apparently reason this way about this substitution: as long as revenue covers the debt amortization payments, the charges for depreciation expense are unnecessary. These officials do not seem to realize that indebtedness can be amortized and depreciation charged to operating expenses at the same time, missing the point that recovered or earned depreciation, even in the absence of a depreciation fund, provides funds for amortization payments. They may believe, too, that depreciation accounting as well as amortization payments results in a double counting for investment consumption. This is true only when the city counts both of them as costs of service.

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* Municipal transportation systems, operated in a somewhat private manner, are not commonly assigned the total community or social costs of service. Streetcars or slow busses reduce the movement of traffic, car tracks affect the quality and maintenance of streets, and surface transportation requires more riding time of the populace than subways do; yet these consequences rarely seem to be counted among the costs of existing service. Measuring costs in a business manner, a municipal system can fail to achieve its optimum social service.

The cost of municipal utility service depends on the treatment of the depreciation expense and the debt amortization payments. At one extreme no charges are made for plant depreciation, and debt payments are not counted as operating expenses; no charge is made for the use of the plant. Next, depreciation accounting is used, but the depreciation charges are not large enough to account for all plant depreciation; the computed cost of service is less than its full cost. Third, debt payments are treated as costs of service, but the debt does not cover the whole value of the depreciating plant; again the computed cost of service is below its full cost. Fourth, the city, trying to compute the full service cost, provides for full depreciation accounting. Similarly, when the whole plant is financed by borrowing, debt payments (exclusive of depreciation charges) can account for the whole consumption of investment values. Fifth, a city can do some double counting: it can include both periodic debt payments and periodic depreciation charges in the computed costs.

One problem is the measurement of the total annual cost of municipal utility service. The debt payment or depreciation charge can be one of the important costs. Yet when some municipalities own and operate utility plants, they fail to include either depreciation charges or debt amortization payments among the reasonable costs of service.[4] This defect is most common in the small towns where the mayors, councilmen, and clerks are part-time officials. They are men of good character rather than expert administrators. They are not men who know how to set up accounting systems, measure the depreciation of equipment, and control the prices of utility service. Nor do they always earmark the utility plant debts and keep them separate from general municipal debts so that the annual debt payments can be easily counted as utility service costs. These officials, who have good intentions but limited ability, do not see any important reason why the costs of municipal utility services should be carefully computed. If the municipal plant never can be self-supporting, depreciation charges or debt amortization payments do not alter the deficit condition. But the city, trying to control the relation between more utility service and taxation, can use a full statement of the deficits. On the other hand, when a city can get enough revenue for self-supporting utility service, the debt payments or depreciation charges should be counted as production costs. Otherwise the city neglects the long-period costs of plant replacement and plant maintenance. Planning to continue the production of utility service, a municipality recognizes the limited life of its utility plant and plans to make reinvestments. Either the debt payments or depreciation charges translate the past investment costs into annual costs; they are approximate, current measures of the continuing investment costs of municipal utility service.

When the service costs are measured, a second problem is the choice between depreciation charges and debt payments. If the period of debt repayment is the same as the estimated service life of property and if the debt covers all the depreciating property values, then the annual debt payment is equal to a straight-line, annual charge for depreciation. But the period of debt repayment may be shorter or longer than the probable service life of property. And when the whole plant is not financed with bonds or notes, depreciation accounting obviously is more thorough than debt amortization in making a translation of investment costs into annual costs. Depreciation accounting seems to be the best choice for most cities. Some municipal utility systems need more than full-reserve accounting for depreciation; they also need a depreciation fund, an asset account that earmarks the recovered depreciation charges. Obtaining enough revenue to cover operating expenses, depreciation expense, and a return on the public investment, a system recovers its depreciation expense. But the city government can conscript the cash that represents the recovered depreciation. At the moment the system may not need the funds. In time, however, it wants to finance plant replacements and improvements; then it does not have investable funds. Using a depreciation fund, the managers of municipal plants have some protection against such a loss of cash; the city officials may not be so grasping if they are clearly taking funds that are earmarked for utility operations.

A third problem is double counting for the long-period, investment costs of utility service. When both depreciation accounting and debt amortization are used, a question arises about double accounting for the property use. If both the depreciation cost and the debt payments are treated as costs of service, the city tries to get a higher price level and more revenue than when the depreciation cost alone is counted. This problem obviously turns on what should be listed as a cost of municipal service. There is no question about depreciation cost. It is a cost of service associated with the long-period, continuing use of property. Debt amortization payments can be treated as appropriations of cash rather than operation costs. But some municipal systems do treat both the depreciation provisions and amortization requirements as production costs.[5] Earnings are expected to cover the depreciation costs and the debt repayments.

Consequently these systems are working toward a debt-free condition as well as a 100 per cent reserve for depreciation. In the thirties several large municipal electric plants already had reduced their debts to less than 30 per cent of the plant values, and at the same time they had accumulated depreciation reserves that sometimes exceeded 50 per cent of the same plant values.[6]

Counting both the depreciation charges and debt repayments among service costs, municipalities simplify their financial problems. Amortization requirements eliminate or greatly reduce the existing indebtedness. Accumulating earned depreciation, the municipality piles up earmarked funds that can be used to finance replacements and new equipment. This comfortable fiscal condition is achieved at the expense of old consumers. When the utility service is new, the prices are high enough to pay amortization requirements and to accumulate a depreciation reserve. Price reductions for consumers are put off. After the debt is wiped out, the earnings do not need to be so high. Now the computed costs of service are reduced, because the debt charges stop and only the depreciation charges on the existing property remain. Now the rates can be reduced. One generation of buyers provides enough revenue to eliminate the indebtedness; another obtains price reductions. Yet, when both plant depreciation and debt amortization charges are included in service costs, the municipal plant managers have a good reason for the practice. This is a means of escaping voter control of plant investments. To avoid voter control from year to year, the plant managers can make new investments out of current earnings. To be free of this control for a longer time, the managers must eliminate the outstanding debts and tie up plant replacements with depreciation accounting. While a system pays off the present debts, it also recovers depreciation charges and accumulates assets that can be used to finance plant additions and plant replacements.

Segregation of Utility Plants. Another problem is the elimination of joint financing, accounting, and pricing relations between two or more kinds of municipal utility plants. A city may own and operate two systems—say an electric system and a water system. In some towns, commonly the small towns, the two kinds of plants are jointly managed. Revenues and expenses of the two services are recorded in a single accounting system; the funds of the water-service department mingle with those of the electric-service department; and some towns issue joint bonds for the two plants. When utility systems are managed under these conditions, the earnings of one enterprise can be used to cover the deficits of the other system. The profits from electric service, for example, may cover the deficiencies of water earnings.

The electricity buyers should not be burdened with the deficits of water service. Water and electric service are sufficiently distinctive so that they should be handled separately for accounting, financing, and pricing purposes. If any consumers have first call on the excessive earnings of a municipal electric enterprise, they are the electricity consumers. Either public officials or the voters may approve subsidation of water service; if they do, the subsidy cost of water operations can come out of tax revenue. A public water system can incur deficits because the city does not pay for fire-protection service, or because the city government, anticipating a rapid population growth, increases the output capacity of the plant. None of these reasons for water-system deficits have any bearing on electric operations. The costs of fire protection or anticipated urban expansion are general costs of municipal government and are rightly charged to the taxpayers.

Taxes and Contributions. When the service standards and prices of private and municipal systems are compared, the managers of private companies like to point out that municipal systems do not pay taxes. True; municipal utility plants do not pay taxes in the same way that private companies do. But in some states the public systems are required to pay what are called "tax equivalents." And they make other contributions to local governments. Municipal utility systems often have given cash and free (or underpriced) services to their governments. In many cities these contributions are so large that they sometimes exceed the tax payments of similar private companies. They are, in fact, a special problem of the earnings control for municipal plants.

The service or cash contributions to municipal governments are partly consequences of inadequate governmental accounting. Many cities do not set up separate accounting systems for their utility plants; the revenues and expenses of utility services are recorded in the general system of accounts. All municipal functions, the general or political as well as the specific or proprietary functions, are lumped together. Consequently a city government can readily appropriate utility earnings and cash; it can substitute these earnings for taxes. A municipality can use the utility earnings to improve streets, to build and maintain parks, or to pay the salaries of city employees. If the city has only one bank account for all its functions, the transfer of utility-system funds to general municipal operations is easily facilitated.[7] Mingling with other municipal funds in a joint bank account, utility-plant funds lose their identity. Just as recovered depreciation charges should be earmarked by means of a depreciation fund, so the bank deposits of a utility system should be kept separate from other city funds.

Municipal electric plants often make no charge for street lighting, water pumping, and the lighting of public parks and public buildings.

Municipal water systems frequently do not collect anything for water service for public parks, street cleaning, and fire protection. Or the city governments pay only nominal prices for the electric or water services. These nominal prices do not equal the full costs of the services. They often do not equal their separable costs—for example, they may not cover costs of plant capacity and hydrants for fire-protection service. Some municipal systems pay liberally, moreover, for the use of public buildings. When an electric plant in Minnesota had offices in the city hall, it paid an annual rental that was equal, curiously, to the annual amortization payment on the outstanding city-hall bonds.[8] The plant used only a part of the city hall, but it amortized all its indebtedness.

Sometimes the funds of the municipal utility system are earmarked for a specific public improvement such as a swimming pool or a city park. In other cases the contributions are used for general municipal purposes, including the salaries of employees and officials. If the cash contributions of the municipal plant are large enough, the city can eliminate all taxes and can live on the revenue from the utility operations. It thus becomes a taxless city. City officials are proud of their taxless cities. Assessing the general costs of government to utility customers, they think that they have a commendable political achievement. Apparently the reduction or even the elimination of local taxes, rather than a large output of low-priced and efficiently produced service, is the real objective of municipal ownership in these cities. Zealously arguing for low-priced municipal service, the original partisans of municipal ownership overcome the private utility company. Then the local politicians forsake the low-price objective and substitute the tax-reduction purpose that has a wider political appeal.

The municipal utility systems commonly contribute cash and free services to their local governments. But the amount of these gratuities is not fully known, only fragmentary information concerning them being available. The cash contributions and free services for some electric plants in 1933 and 1936 were compiled by the Federal Power Commission.[9] In 1933 the taxes, cash contributions, and estimated free services were 0.9, 14.2, and 7.4 per cent respectively of the gross revenue of about 1,600 electric plants. And in 1936 taxes and contributions were 17.3 per cent, and the value of free services was 8.5 per cent of the gross revenue of 537 municipal electric systems. In 1936 the municipal electric plants contributed approximately 25 per cent of their gross revenue to the communities in which they operated.

According to the studies of the Power Commission, the cash contributions and taxes (tax equivalents) in some states were higher than

30 per cent or even 40 per cent of municipal plant revenue.* The cash contributions were particularly high in Southern states except where the Tennessee Valley Authority (as described in Chapter 34) limits the "take" of the cities.† The value of free services often exceeded 10 per cent of the gross revenue of municipal electric systems; and in a few instances the value of free services was more than 20 per cent of the electric revenue. In 1936 the taxes, contributions, and free services were more than 50 per cent of the total revenue of municipal electric systems in the following states: Idaho, Oklahoma, Kentucky, Florida, Virginia, and Louisiana. On the other hand, contributions and taxes were small in the states that had many municipal electric plants. In 1936 they were less than 12 per cent of gross revenue in such states as Washington, California, Nebraska, Minnesota, and Iowa, and less than 2 per cent in Ohio and Oregon.

Even if they are proprietary undertakings of a city, municipal utility plants need not be exempt from payments that are equivalent to taxes. But free services and cash contributions are poor substitutes for taxes. The amounts of the cash contributions are uncertain, and generally seem to be based on the municipal plant earnings, not the public responsibilities of the plants. A prospering municipal system contributes more cash and services than a struggling system. And only the municipal governments receive the cash contributions and free services. As long as the state, county, and federal governments do not share in them, they can scarcely be full substitutes for taxes.

Although tax equivalents seem to be justified, the cash contributions and free services often are larger than reasonable tax equivalents. They commonly exceed the local tax payments of private utility companies; sometimes they even exceed the rate of private company payments for all federal, state, and local taxes. Large contributions and free or underpriced services clearly are used to exploit consumers. Many municipal governments look upon municipal ownership of utility plants as a way to make money, as a way either to reduce taxes or to increase municipal revenue. Protagonists of municipal ownership strongly condemn the profits and dividends of private utility firms. Yet many municipal systems

* The payments of tax equivalents, which commonly are used only in the states with quite notable public-ownership movements, were included with cash contributions in the 1936 study. During the thirties tax equivalents ordinarily were nominal, though in 1933 they were more than 4 per cent of gross revenue in Colorado, Washington, and Wisconsin. And when the Tennessee Valley Authority wanted to limit the cash contributions of affiliated municipal distributors, it prescribed tax equivalents that could not be higher than the established tax rates times the plant values.

† Summarizing the 1944 contributions of some municipal electric plants, the City Managers Association reported that several cities obtained more than 50 per cent of the gross revenue of their electric plants.[10] The lowest contributions were made in Tacoma and Seattle; they were about 1 per cent of the electric plant revenues.

exploit consumers quite as much as the private companies do. Only one difference is evident: companies use excessive earnings for large dividend payments, while the cities use them for general municipal services or improvements. Construction of a swimming pool or payment of policemen's salaries, for instance, is substituted for price reductions and more consumption of utility service. This is a place where the political and proprietary functions of local governments are confused. The buyers of municipal utility services pay for city services and civic improvements that interest them as citizens but not as consumers of utility services.

The mistaken nature of this earnings policy can be demonstrated clearly where free or underpriced water service is provided for fire protection. Nothing or only nominal sums are paid to the municipal water department out of general tax revenue. Fire protection is provided for the property owners of the city. If the benefit principle of taxation is used, the property owners pay the costs of fire protection. Surely the property assessments for taxation purposes are better measures of fire-protection benefits than the water consumption of domestic, commercial, and industrial buyers. Yet the water consumers pay the costs of the free and underpriced services. To reduce the burden of property taxation, municipal officials are willing to charge high prices to utility consumers. Mayors and councilmen profess an interest in a good municipal-ownership record for water and electric plants, but they often seem to have a greater interest in the cash contributions and the free services that displace taxes.

Rate Reductions. Buyers of municipal utility services do not always receive large and frequent price reductions. Among the limitations of price reductions are the cash contributions and free services. City officials are anxious, moreover, to pay off the municipal plant indebtedness. Preferring a quick liquidation of revenue bonds or general bonds, they defer rate reductions until financial security is assured. They may go further and treat both depreciation and debt amortization as costs of service, deferring sizable rate reductions for 20 or more years. A third limitation on rate reductions is the inertia of public management. Consumers of municipal water service often pay the same rates from decade to decade, because public authorities seldom think about rate changes. But some city officials and municipal plant managers are rate conscious, particularly when they are selling electric service. Anxious to live up to the low-price objective of public ownership, they reduce prices every time they have an opportunity. They can carry the low-price policy too far. A self-supporting municipal system, providing fully for property depreciation and future maintenance of service, obviously cannot afford unlimited rate reductions.[11]

Municipal ownership of utility plants offers an opportunity for experimental pricing. The managers need not follow the conservative pricing practices of private utility companies, holding back price reductions until the earnings are excessive, until the buyers "earn" the price reductions. They can offer lower prices to buyers and wait for their reactions. If the buyers do not have an elastic demand for service and the total revenue of the system declines, the old rates can be restored. Unlike the private companies, municipal systems usually do not go through regulatory investigations every time the rates are increased. On the other hand, the demand may be elastic. If the total revenue increases enough to cover the cost increment of the new sales, the price experimentation is justified. Taking chances on price reductions, a municipal plant can expand consumption and increase the use of its capacity. Yet the municipal systems seldom experiment with prices. Except in areas where municipal electric plants are in contact with federal power projects like the Tennessee Valley Authority, the public managers apparently have no more interest in experimental price reductions than the managers of private firms.

Class Pricing. The small municipal electric and water plants often have only one service classification. Since most of their buyers are families and small commercial establishments, one rate schedule is sufficient. Only nominal increases in earnings can be realized from class-price differentiation in the villages and small towns. Class pricing is practiced, however, by large municipal electric plants. These plants sell service to large industrial and commercial buyers as well as residential customers, though they often do not have so many buyer classifications as private electric companies have. Insofar as they classify buyers, they seem to have a discriminatory pattern of class prices. A municipal electric plant, like a private company, can sell electricity to industrial buyers only when the price is as low as or lower than the cost of power from any other source. If the municipal plant sells service to industrial buyers, the price cannot be higher than the industrialists' own cost of electricity generation. It must reckon with the elasticity of industrial buyers' demands. Similarly, the prices of water service are lower for industrial buyers, who often can develop their own water supplies, than for the residential buyers who have an inelastic demand for service.

The managers of municipal plants are not aware that they have a discriminatory pattern of class prices. Like many state commissioners and private company managers, they do not comprehend that demand differences are the basis for a discriminatory differentiation of prices. The municipal systems apparently copied parts of the class-price pattern of private utility firms. When they adopted the private pattern of pricing, they also took over the cost rationalizations of private companies. Now the municipal plant managers explain the price differentials according to cost behavior, and do not recognize the obvious demand differentiation of class prices.[12]

Municipalities occasionally have a special reason for low electricity prices for industrial service. A city desires to draw additional industries to the town. Low power costs are one attraction.[13] When industrial power rates are reduced to attract new industries, the reductions are similar to cash contributions to the city's government. Residential and commercial buyers forego price reductions so that a new industry can be subsidized. Yet the whole city, rather than the utility consumers alone, benefits from the industry—from more pay rolls and more employment. Like the case of free services and cash contributions, these special price reductions in industrial rates should be financed with tax revenue instead of utility plant revenue.

Forms of Price Schedules. The familiar price forms of private service are used by municipal plants. Although the block-price schedule is dominant, the price forms vary from a flat price each month or year (a common price form for water service) to complicated three-part rates for industrial service. Like the classifications of buyers, the price forms for municipal utility service frequently are copies of private forms. This is most evident among municipal electric plants. They freely use the quantity-discount form of pricing, differentiating between buyers according to the amounts of their purchases. But most municipal systems do not carry this kind of discriminatory pricing so far as is done by the private firms. When private and municipal rates are compared,* the differentials between large-buyer and small-buyer bills is lowest for the municipal service. Municipal electric systems use service charges and minimum bills less frequently than the private companies; and they do not always charge high prices for the initial blocks of electricity. The municipal electric plants do not put a strong emphasis on promotional pricing. Because promotional pricing is moderated, discriminatory pricing is tempered. Yet, despite these modifications, the schedules of municipal electric plants still show evidence of discriminatory pricing.

Municipal water plants use simpler price forms than those of the municipal electric plants. Much of the municipal water service is sold at flat rates, though many municipal water systems have substituted meter rates for flat rates. As a general rule they do not choose meter rates instead of flat rates because they want to practice price differentiation between large and small buyers. They do it so that the plant capacity can be conserved; they wish to curb careless use of an available water supply.

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* See the description of comparative electric rates in the latter part of Chap. 29.

Many systems sell water, indeed, at a uniform price for each thousand gallons. And when some water systems use block rate schedules, the price differentiation usually is less accentuated than in electric block schedules. The prices for municipal water service do not follow carefully the promotional pattern of pricing; they do not follow all the rules of the so-called "scientific" pricing.

STATE-COMMISSION REGULATION

The practices of municipal utility systems reveal a need for public regulation. Deficiencies in public plant accounting, particularly the depreciation accounting or the combination of municipal plant accounts and funds with the general municipal accounts and funds, are obvious reasons for public regulation. Separation of tax problems from service problems is needed. Furthermore, the mayors, city councils, and the technical men who are employed to operate municipal utility systems frequently are not trained to choose desirable price and service policies. Except in the areas where the TVA and other federal projects are exercising a wise and effective control of municipal electric systems, this is a place for state control; commission regulation can be used to prevent careless management, city government exploitation, and poor price and service policies of the municipal systems.

Extent of Commission Authority. About half of the state utility commissions have authority to prescribe uniform accounting systems and other accounting practices for municipal utility plants. A similar number of commissions regulate the rates of municipal systems that sell service outside of municipal limits. This authority over outside rates, as well as the issuance of certificates of convenience and necessity for outside extensions, apparently is designed to control the conflicts between municipal and private systems, not to regulate prices and service practices for consumers. But in eleven states, where the commissions have authority to regulate municipal service prices within the cities, the legislatures wish to protect buyers. In 1941 the Federal Power Commission made a compilation (see next page) of state-commission controls of municipal electric systems.[14]

Even though some commissions have authority to regulate all municipal rates, they do not make much use of their powers. The New York Commission, whose right to regulate is upheld by the state courts,[15] makes quite extensive use of its authority over municipal accounts, service, and rates.[16] In Wisconsin, where the public utility status of municipal plants is settled,[17] the commission orders service extensions to holding-

	Number of states
State-commission authority to regulate:	
Residential, commercial, and industrial rates	
Inside corporate limits	11
Outside corporate limits	18
Rates for energy used by municipal agencies	10
Service standards and performances	13
Initiate investigations on own motion	13
Scope of operations (require certificate)	
Inside corporate limits	7
Outside corporate limits	17
Uniform system of accounts	19
Accounting practices—records and entries	17
Depreciation rates used in accounts	13
Annual reports	17

out areas and exercises a broad control of the earnings and prices of municipal electric and water systems.* After the great depression of the thirties deepened, the Wisconsin Commission began to assert full regulatory authority over the earnings and prices of municipal utility systems.[19] During the thirties permanent rate reductions were effected, either by the commission or by the cities, for nearly all the eighty-five municipal electric plants that operated in Wisconsin. Within a few years the Wisconsin Commission issued forty-four orders for municipal rate reductions; and even though this kind of regulatory action was new in Wisconsin, the cities objected to only seven orders.[20]

Earnings Control in Wisconsin. When the reasonable earnings of a municipal utility system are fixed, the Wisconsin Commission does not count cash contributions to city governments among the service costs. But charges for school district and local tax equivalents—measured by the school district and local tax rates times the taxable value of the municipal plant—are costs of service. Although full tax equivalents include allowances for state, county, and even federal taxes, the commission does not include them in the measurements of reasonable earnings. It allows only local tax payments. The Wisconsin Commission does not control the cash funds of municipal plants; in Wisconsin a city bank account can contain utility plant funds as well as general public funds. To control municipal plant funds, the commission has only persuasive powers; it can explain and publicize what can happen when utility funds are used to finance the general functions of the cities. Until the authority of the Wisconsin Commission is enlarged, nothing except the warnings of the commission

* Because one municipal water system did not file its rates with the Wisconsin Commission, it was denied the right to collect a bill of $250,000 for water service from another municipality.[18]

and the good sense of local governments can prevent diversions of the municipal plant funds.

Each municipal plant is studied separately when the reasonable earnings are determined.[21] A prospering electric system, for instance, is not allowed to support a less prosperous water plant. Each system is allowed a fair return on its property value. The property value usually is defined as the investment cost less the accumulated reserve for depreciation. Only used and useful property is included in the rate base. Some replacements and extensions of municipal plants in Wisconsin, as in other states, are financed out of the earnings of the plants. Believing that buyers should not pay twice for the same property, the commission does not grant the municipal plants a return on property that is financed out of earnings. This is an application of the commission's "Mondovi principle," a rule that was first used in the Mondovi Telephone decision in 1932.[22] This rule also is used to measure the accrued depreciation. The depreciation reserve measures the accrued depreciation, and is deducted from the investment cost to determine the net property value on which a return is allowed. Since the consumers are expected to pay enough for service so that a municipal system can recover depreciation charges, the depreciation reserve is a measure of recovered investments. If conservative depreciation accounting is practiced and if the depreciation reserve exceeds the actual plant depreciation, the commission reasons that the buyers should not pay more than once for the use of the same plant.

Following a statutory requirement, the commission gives municipal plants "the same rate of return as permitted for privately owned utilities." When the rates of return of private companies were pressed down during the thirties, the rates of return of municipal plants, too, were reduced. A rate of return of 5½ or 6 per cent was allowed in several cases.[23]

The Wisconsin Commission, like other commissions that have occasional interests in municipal system control,[24] does not yet have a distinctive pattern of earnings control for public plants. A traditional standard of earnings control, a fair return on a fair value, is applied to the municipal systems. A definite meaning is given to reasonable property value: it is the investment cost less the depreciation reserve. But the fair rates of return are measured alike for private and municipal systems. The earnings of municipal utility systems are measured in a businesslike manner; earnings still seem to be more important than the production and consumption of service.* Neither Wisconsin legislators, regula-

* The Montana Commission probably expresses a common view when it says that municipal plants ". . . to operate successfully must be guided by legal and business principles."[25]

tors, nor city officials apparently are ready to tie up earnings control with price experimentation, or extensive and intensive expansion of service.

Price Policies. Free services for municipal governments are prohibited by the Wisconsin Commission. This commission also tries to eliminate underpricing of the services that municipal plants perform for cities. For street-lighting rates the Wisconsin Commission sets up price schedules that contain a fixed or "investment" charge covering the costs of special street-lighting equipment, another fixed charge for lamp renewals and other maintenance costs, and a blocked schedule of prices for electricity purchases.[26] Sometimes a two-part rate, containing an investment charge (including the costs of lamp maintenance) and an energy charge, is used. In one Wisconsin village the investment charge was fixed at $15 a year for each overhead lamp, and at $24 a year for each ornamental lamp. And the energy charge, which was low because idle plant was used during the early morning hours, was fixed at 3 cents a kilowatt-hour for the first 1,000 kilowatt-hours and 1½ cents for each additional kilowatt-hour.[27] Dealing with municipal systems, the Wisconsin Commission also wants to assess the full cost of fire-protection service to the cities.[28] When the city of Milwaukee, for instance, sought an increase in water-plant earnings and asked for higher domestic service prices, the commission concluded that the fire-protection price could be increased 10 to 12 per cent.[29]

Problems of price differentiation arise chiefly among the municipal electric plants. Neither the Wisconsin Commission nor any other commission studies the best social limits of class-price differentiation for municipal electric service.[30] Differentiation between residential and commercial or industrial buyer classes apparently is encouraged; the commission does not show that it understands the economic nature or social consequences of discriminatory pricing. Buyer-class differentials seem to follow a common private pattern of price differentiation. At any rate, the buyer classifications for municipal plant service bear a close resemblance to the buyer classes of private company service. And most of the municipal electric plants in Wisconsin now use the same kind of price schedule. This schedule contains a service charge, which usually is less than a dollar a month, and a blocked schedule of energy charges. The Wisconsin Commission does not recognize that this schedule is a discriminatory form of pricing; the commission sees only the promotional nature of the schedule. It does not consider the social effect of the differentiated price schedule on various buyers. It does not ask who the large and small buyers are, and consequently neglects the relation between the price schedule and buyer incomes. The commission wants to sell electricity at the lowest average prices to the buyers who can afford expensive appliances. The commission is willing to accept a private standard—a discriminatory standard—of promotional pricing.

A PLACE FOR MORE SOCIAL CONTROL

Past experiences with municipal utility plants show that something more than spirited, partisan-led movements to oust private firms and set up public systems are needed if the plants are to achieve distinctive social results. Deficient accounting systems, doubling up of depreciation and amortization charges (or neglect of either measure of investment costs), widespread cash contributions and free services to local governments, and discriminatory patterns of pricing—these are some significant shortcomings. They show carelessness in public management, manipulation of public enterprises toward expedient political ends, a willingness to exploit consumers, and a lack of common social policies that can be distinguished clearly from private-business objectives. To get a larger social performance out of municipal utility systems and to show more obviously the superiority of public ownership, either the local or state governments must give more attention to the management and achievements of the plants. Each municipal government can reorient its views of public production and organize operations exclusively in the interest of consumers; unfortunately, most of them seem satisfied with the present policies. To realize better management of public production apart from the TVA territory or other areas where the federal government does or can control the behavior of municipal electric plants, consumers must depend perforce on state commissions. Perhaps the state commissions, specializing in private company control and often lacking funds as well as expertness or social perspective, are not really good choices for municipal plant regulation, but they seem to be the best available sources of control in the present political environment. Consequently they should be authorized and encouraged to give more attention to municipal utility operations—to require social achievements that are superior to the money-controlled results of private production.

Chapter 31

Regional Power Projects

BOULDER DAM on the Colorado River, the Tennessee Valley Authority, the Grand Coulee and Bonneville dams on the Columbia River, the Central Valley project in the Sacramento and San Joaquin valleys of California, and the Nebraska Public Power System—these and many other projects were financed by the federal government after 1930. Assuming the responsibility for the use of water resources, the federal government built multiple-purpose dams that produced flood control, navigation, and irrigation benefits as well as hydroelectric power. This new era in public power production began after the New Deal Administration became overwhelmingly dominant in 1933. It began after the people lost respect for private utility companies, grew weary of the ineffectiveness of commission regulation, and were willing to amend their creed of individualism. During the thirties the public power movement was led by President Franklin Roosevelt, the astute and spirited politician who was a public-ownership protagonist before he entered the White House. At first the projects were part of a general public-works program, the program that provided employment, was supposed to stimulate private investments, and was expected to lead the way to an economic recovery. Later, the main impetus for further project investments came from local and regional groups that commonly wanted some "easy" federal money, that wanted public improvements more than outlets for unemployed laborers.

THE EARLY RECLAMATION PERIOD

Long before the federal government began to build multiple-purpose projects, it financed a number of irrigation improvements. After the Reclamation Act of 1902 was passed, the Bureau of Reclamation in the Department of the Interior controlled irrigation projects in seventeen states west of the 100th meridian—from the Great Plains to the Pacific Coast. This is largely a sparsely settled, semiarid area where the land is used for grazing unless irrigation improvements are made. Water is more important than soil. Water determines the distribution of the populace, and makes the difference between a crop of thin grass, mixed with sagebrush, and a green valley of orchards, vegetables, sugar beets, grain, and hay.

From the Rio Grande and Imperial valleys in the South to the Montana and Washington valleys in the North the landowners always have looked for water. After the "Inland Empire," Rocky Mountain valleys, and the Great Plains were settled, the landowners built their own irrigation systems or asked the state and federal governments to build them. By 1929 about nineteen million acres of land were irrigated.[1] But the irrigation undertakings were not always spectacular improvements, consisting of mammoth dams, large diversion canals, and many square miles of irrigated land. About a third of the nineteen million acres were irrigated by projects that were small enough to be classed as individual or partnership undertakings. Another third was improved by cooperative enterprises that commonly were confined to small-scale operations. And irrigation districts and water-users associations, which had authority to incur indebtedness and to levy taxes or assessments, controlled about a quarter of the irrigated acreage in 1929.

In 1929 only 7.5 per cent of the irrigated acreage was controlled directly by the Bureau of Reclamation and the Bureau of Indian Affairs.[2] The federal irrigation projects naturally were larger than most of the cooperative enterprises, irrigation districts, and water-users associations. They were the projects that local interests could not promote and finance. Within five years after the Reclamation Act of 1902 was passed, twenty-five projects were approved for construction.[3] Work started on the first project, the Carson-Truckee improvement in Nevada, in 1903. This program was strongly supported by another Roosevelt, President Theodore Roosevelt who always liked the semiarid West. But Congressional enthusiasm for irrigation undertakings tapered off; only one project was undertaken between 1907 and 1920.[4] Yet a number of improvements were constructed during the first quarter of the twentieth century. Some of the largest ones were the Salt River and Yuma ventures in Arizona, the Elephant Butte improvement on the Rio Grande River, reclamation of the Yakima Valley in Washington, and the Boise project in Idaho.

Unlike the present watershed improvements, these early water-use projects were designed for a single purpose. They were built to irrigate dry or semiarid valleys. Located in a section of the country that had large and undeveloped hydroelectric resources, they could jointly produce irrigation service and electricity. But production and sale of electricity was a secondary or even an incidental purpose of the reclamation projects. Some of them, in fact, produced no electricity at all, or produced only enough energy for uses around the dams and for water pumping. And when electricity was produced beyond project needs, it commonly was sold to private power companies. It was sold to private firms, even though a statutory preference for sales to publicly owned systems was stated by Congress in 1906. The Bureau of Reclamation was devoted to the irrigation of arid lands, and public power production was put off until a later day.*

LARGE MULTIPLE-PURPOSE PROJECTS

Before the New Deal program began to develop in American politics, the most notable public enterprise in North America was administered by the Ontario Hydro-Electric Power Commission. Beginning in 1906 under the firm leadership of Sir Adam Beck, the Ontario system acquired private electric companies, built generating plants and transmission lines, and soon blanketed the province of Ontario with urban and rural service. It was organized into five systems, ranging from the Niagara (the largest system that obtained electricity from Niagara Falls and Ottawa River plants) and Eastern Ontario systems, to the Thunder Bay system around Port Arthur and Fort William. The Ontario Commission relied on hydroelectric power, partly because Sir Adam Beck did not want to be dependent on American fuel.[6]

American proponents of public power service knew that the Ontario system could be duplicated in the United States. When the opportunity for public electricity production came, American projects exceeded the scope and capacity of the Ontario Commission. Integrated development of the water resources of a whole watershed was the American objective, because piecemeal construction and single-purpose projects were considered inefficient. Use of watersheds was planned by the Federal Power Commission and other federal agencies, and projects were built to produce not only electricity but also flood control, navigation, and irrigation benefits.

The Boulder Project. Along the lower part of the Colorado River in Arizona and southern California is some of the most arid land in the United States. If the fertile valley lands produce vegetables, fruits, and grains, they must be irrigated. Shortly after 1900 the water of the Colorado River was brought to the Imperial Valley. Even so, the farmers were troubled continually by either floods or water shortages. The Salton Sink, in which the half-million irrigated or irrigable acres of the Imperial Valley are located, is below the sea level. In the spring flood season the Colorado River, flowing along the rim of the Salton Sink, occasionally overflowed and made an undrained lake in the Imperial Valley. And when the irrigation canals breached the banks of the river, the chance of floods increased. As the flood waters spread over the valley floor, they deposited tremendous quantities of silt that the Colorado River carried. This silt reduced the fertility of the excellent Imperial Valley land. Then in another season the water problem was reversed: the Imperial Valley farmers had too little water for their truck farms and orchards. In 1934, just before the Boulder project was completed, there was a water shortage in the Imperial Valley that ruined $10,000,000 worth of crops.[7] The stimulus for the Boulder project, the first of the nation's great multiple-purpose undertakings, came from the landowners who wanted better control and more complete use of the Colorado River. It was conceived and sponsored primarily as a reclamation project.

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* When public power production became a national policy after 1930, the electricity capacity of some early reclamation improvements was developed. Now most of these projects make commercial sales of electricity.[5]

State governments in the Colorado River basin discussed the Boulder project for a long time. The main conflict was between Arizona and California. Half of the 1,200-mile course of the Colorado River is within Arizona's borders, and much of the Colorado River water comes from Arizona tributaries. And the "flowing gold" of the Colorado is the largest source of water in Arizona; it is water with which the people of Arizona hope to irrigate their valleys someday. Although in 1930 the Arizonans were not ready to pump Colorado River water over mountains to the central Arizona valleys,[8] they did not want the Californians to acquire prior rights to their water.* They wanted to protect a future supply of water. As a minimum condition they wanted payments for California use of Arizona water and electricity.[10] Consequently the people and public officials of Arizona resisted the construction of the Boulder project.†

The only large outlets for Colorado River water were in California. Farmers in the Imperial and Coachella valleys wanted irrigation water; inhabitants of the Los Angeles area needed more water for domestic and commercial uses; and the Los Angeles area was the only sizable market for electricity. Except for Arizona, all states in the watershed ratified a compact in 1923. This compact allocated the Colorado River water to each of the seven states. Refusing to sign the compact, the state of Arizona held up construction of the Boulder project. But Arizona could not stop the enterprise; Congress passed the Boulder Canyon Project Act in 1928, and construction of Boulder Dam was begun after six states, exclusive of Arizona, approved the act. This was a "Republican" rather than a "New Deal" enterprise. President Hoover, who liked river improvements but was opposed to a general public power program, wanted the Boulder project.

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* The common-law rules of riparian rights are not in force in arid Western states. Instead, the principle of prior appropriation is used. According to the prior-appropriation principle, a landowner's right to flowing water is determined by his established uses of water rather than his location on the stream.[9]

† Arizona threatened to use force to stop the construction of the Boulder and Parker dams. In 1928 and 1935 the Arizona National Guard was called out to stop the construction work. In 1944 the state of Arizona finally signed the Colorado Compact that prorated Colorado River water to the seven states of the watershed.

Located in Black Canyon below Las Vegas, Nevada, Boulder Dam is 727 feet high. It is the highest dam in the world. Lake Mead, the reservoir behind Boulder Dam, is large enough to hold about two full years' supply of the flashy water flow of the Colorado River. About 150 miles down the Colorado River from Boulder Dam is a smaller improvement, the Parker Dam. Unlike Boulder Dam, it does not have an enormous storage capacity. Although the Parker Dam produces electricity, the Parker reservoir is used mainly to supply water for the Metropolitan Water District that is transported to the Los Angeles area through a $200,000,000 aqueduct. A third dam, Davis Dam, is sixty-five miles below Boulder and is used to regulate the water flow. The All-American Canal, another part of the Boulder project, carries water from the Colorado River to the Imperial and Coachella valleys. This canal replaces the old canal that passes through Mexico. Whereas the Mexican landowners (mostly American citizens) received half of the water from the old canal, landowners of the Imperial and Coachella valleys get all the water from the new canal. (The Mexican landowners still get water from the Colorado River; a 1945 treaty grants them more water, indeed, than they obtained before the Boulder project was completed.[11]) The All-American Canal is financed separately from Boulder Dam; assessments against landowners and some revenue from electricity are used to amortize the canal investment.

The Department of the Interior, which was given control of the project, allocated Boulder electricity to different areas and users. The states of Arizona and Nevada each could purchase 18 per cent of the firm energy.[12] (Firm energy was defined as the electricity supply that was available at all times.) No one expected the people and industries of sparsely settled Arizona and Nevada to use their allotments,* though the people of these states believed that they still had a right to the electricity. Another 36 per cent of firm power was allocated to the Metropolitan Water District that uses electricity for water pumping. The remainder was allocated to municipal and private electric systems in southern California, the municipal electric plant in Los Angeles being allocated the largest amount of any distributor. The Metropolitan Water

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* Because they cannot consume their electricity allotments, Arizona and Nevada each are paid $300,000 a year.

District has first call on the secondary power, the electricity that is not available regularly. If the Water District does not take all of the secondary power, the remainder can be purchased by the Los Angeles municipal plant and private companies.

The Tennessee Valley Authority. No other multiple-purpose project is given so much public attention as the Tennessee Valley Authority. This project, which embraces the whole watershed area of the Tennessee River from the Appalachian Mountains to the Ohio River, is a model for many other water-basin improvements. When the federal government started to build the Wilson Dam during the First World War, it created a problem that eventually was solved by organizing the TVA. Located at Muscle Shoals on the Tennessee River, Wilson Dam and other structures were designed to produce nitrate. Only one nitrate plant was finished during the First World War. And when construction work was halted in 1921, only a third of the Wilson Dam was built.[13] Then the federal government did not know what to do with the dam. During the twenties Congress authorized surveys of the Tennessee watershed, and considered the offers of Henry Ford, industrial companies, and private electric companies for the incomplete Muscle Shoals project. Throughout the twenties a public power bloc, led by Senator George Norris, persistently tried to turn the Muscle Shoals project into a full-scale producer of public power and to start public use of the water resources of the whole Tennessee River basin. But President Coolidge exercised a pocket veto on a proposed Cove Creek dam, the dam that later became Norris Dam in the TVA system. And President Hoover vetoed a similar bill in 1931, calling public power production a "degenerate" idea.

When the Democrats acquired great political power in 1932 and when private enterprise was no longer a sacred tradition, Senator Norris won his fight for a public power system in the Tennessee Valley. The Tennessee Valley Authority, a semiautonomous government agency managed by three directors, was created in 1933. Congress specified the following purposes of the TVA: the maximum amount of flood control, the maximum use of the Tennessee River for navigation, the maximum production of electricity in conjunction with flood control and navigation, the "proper" use of marginal land, the reforestation of the Tennessee River basin, and the economic and social well-being of the people in the Tennessee basin. These broad, important objectives gave the TVA a wide range of operations. Yet, even though electricity production apparently was "played down" in the Congressional statement of purposes, the production of electricity was a main purpose of the project. Judged by its own conduct, the TVA focused attention on flood control and electricity production.

Like other multiple-purpose projects, the TVA invested heavily in dams and reservoirs. When the TVA acquired the property of the Tennessee Electric Power Company in 1939, it obtained five hydroelectric dams in southeastern Tennessee. To integrate the use of Tennessee water resources, the TVA acquired control but not ownership of five dams that the Aluminum Company of America had on the Little Tennessee River. These privately constructed dams were primarily single-purpose dams; private companies built them, of course, for electricity production rather than flood control. The TVA built a number of large, multiple-purpose dams. Between 1933 and 1945 the TVA not only finished Wilson Dam, but also built fifteen more dams. Seven of these new dams are on the Tennessee River; these are low dams that improve the channel of the river, and produce electricity, but with the exception of the Kentucky Dam just below Paducah do not provide much flood control. The remainder of the dams, which are located on the Appalachian tributaries of the Tennessee River, are high storage dams that primarily produce electricity and flood-control benefits. Owner of about $600,000,000 worth of dams and reservoirs,[14] the TVA has more extensive control of the available water resources of its area than public projects in other regions.

From Knoxville to Paducah, a distance of 650 miles, the TVA provides a nine-foot navigation channel on the Tennessee River. A series of nine dams, including Wilson Dam and a formerly private dam at Hales Bar, create the channel. When the Kentucky Dam below Paducah was finished in 1945, the locks and reservoirs were ready for full-scale barge traffic. The Tennessee waterway is a part of the Mississippi Valley waterways. Barge traffic can move between the Tennessee waterway and the Ohio River and several of its tributaries, the improved Mississippi River channel between Minneapolis and the Gulf, and the Illinois waterway that connects the Mississippi River and Lake Michigan. Like the other Mississippi Valley waterways, the Tennessee waterway is toll free to the barge owners. Since the TVA does not receive any revenue from barge traffic, the estimated freight savings are used to justify the waterway. The TVA looks forward to heavy traffic on the circuitous waterway, but does not say just how much of the transportation economies will go to coal mine owners and industrial corporations instead of consumers of commodities.

Congress directed the TVA to use the dams and reservoirs "primarily for the purpose of promoting navigation and controlling floods." Before the TVA dams were constructed, the Army Engineers estimated that the average annual flood damage along the Tennessee River was $1,780,000. After the land was eroded by careless cultivation and after the hills and mountains were stripped of their timber, late winter or spring floods became regular events in the Tennessee Valley. To hold back the heavy winter and spring rainfall, the TVA built high storage dams on the eastern tributaries of the Tennessee River. The largest of these were the Norris, Cherokee, Douglas, Fontana, and Hiwassee dams on the Clinch, Holston, French Broad, Little Tennessee, and Hiwassee Rivers. From July to December the storage reservoirs are gradually emptied. Then in the rainy season, which begins in January and ends in June, the reservoirs gradually are filled. Regulating the storage reservoirs, the TVA not only prevents floods or reduces the intensity of floods, but also makes the water flow on the Tennessee River more uniform for navigation and electricity production.

Unlike the Boulder project, the TVA was not assured an electricity market as soon as it began to operate. It started to sell electricity in an area where the large population centers were served by private electric companies. At first the TVA competed with the private firms, offering low wholesale rates to municipalities and industries. Later it bought the private electric properties in Tennessee and some private plants in adjacent states, sold the distribution systems to municipalities, and became the largest producer and wholesaler of electricity in the South. When steam generating plants were acquired from private companies, they were used to "firm up" the output of the hydro plants. TVA engineers believe, indeed, that joint use of steam and hydro plants is more economical than the separate use of either.[15] Sales to municipal electric systems or rural cooperatives are preferred. But the TVA does not leave the control of municipal and cooperative systems to local interests. Acting as a regulator of public distribution systems, it prescribes payments in lieu of taxes, financial policies, accounting systems, and retail rates.

While the TVA concentrates on water uses, it also tries to improve the land use and the farm life of the valley. Struggling to obtain crops from eroded hills and rocky or depleted soil, the farmers receive low incomes throughout the valley. An improvement of rural life depends on soil improvements. Knowing this, the TVA tries to improve farming methods and to increase the use of commercial fertilizers. It demonstrates and urges changes in hillside cultivation, adoption of new farming equipment, and use of legume crops that restore nitrogen to the soil. Production and distribution of superphosphate is a notable part of the farm rehabilitation program.[16] Some of the furnaces at Wilson Dam are used now for phosphate production, and a high-grade phosphate is manufactured. Another phosphate plant is planned at Mobile, Alabama.[17]

The Columbia Basin. A large semiarid area in east central Washington, the Columbia Basin, contained mainly low-income land (grazing and dry-farming land) until Columbia River water was brought to it.

This basin, covering an area of more than a million acres, was formed in a glacial period when the Columbia River was forced out of its regular channel. General land settlement of the basin began about 1900. When the Northern Pacific Railroad Company sold land in the basin and homesteaders occupied the public land, there was a brief boom in this desolate, unproductive part of Washington. The boom was brief because water was scarce. Rainfall in the area usually was less than eight inches a year. And after a few crops exhausted the topsoil moisture, the farmers failed to get grain and hay crops, farms were abandoned, and towns deteriorated. Even dry farming, which some hopeful farmers persistently tried, was not particularly successful. Yet abundant water was so near. Flowing only five hundred feet below the edge of the basin, the Columbia River carried the melting snows of the Canadian and American Rocky Mountains during the early summer months when the farmers needed water.

To bring water to the Columbia Basin, the Grand Coulee Dam was built north of the basin. This dam is not so high as Boulder Dam or several other dams. Nor does it hold much of the water flow of the Columbia River. Although the reservoir has a capacity of 5,000,000 acre-feet and is large relative to TVA dams and lesser projects, it holds only four days' output of a medium high-water flow.[18] But Grand Coulee Dam is the largest mass of concrete anywhere—a phenomenal construction job. And it is still the most expensive dam in the United States. Even though all the generating units are not yet installed, the federal government already has an investment of $180,000,000 in the dam.[19] And when all the electrical equipment is installed, the public investment is expected to be about $220,000,000.

The level of the Columbia River is raised 355 feet at the crest of Grand Coulee Dam. Then electric pumps are used to lift irrigation water another 280 feet to a balancing reservoir. This reservoir is in Grand Coulee, the channel of the Columbia River ages ago when glacial conditions forced the river into a new channel. Out of the 23-mile natural reservoir, which is plugged at both ends by dikes, water is carried through canals to the Columbia Basin. About one-sixteenth of the Columbia's water flow is needed to irrigate more than a million acres of basin land.[20] And a new, populous agricultural area, where the size of farms ranges from 10 to 160 acres, will be created. Where vegetation once was scarce and farming was a precarious occupation, the landscape will be green, the fruit, dairy, and grain farms will be numerous, and the towns will be new. Eventually the Columbia Basin probably will have a population of 350,000 to 400,000 people.[21]

Although settlement of the Columbia Basin may take a long time, the Department of the Interior can easily sell water rights to settlers. At least it can sell them as long as the prices for them are based on the productivity of basin land and are comparable to land prices elsewhere.* But the sale of electricity may be more difficult. The maximum generating capacity of Grand Coulee Dam is nearly 2,000,000 kilowatts. That is more electricity capacity than the total installed capacity of all private and municipal electric plants in Washington, Oregon, and Idaho. Public-ownership zealots and the administrators of Columbia River projects speak casually about chemical and metal industries that can be attracted by low-priced power. Perhaps in the technically alive, expanding electric industry ways can be found to absorb Grand Coulee electricity—and more. Yet, even at low prices, the enormous electricity capacity is not certain to be used fully for a long time.

Down the Columbia River from Grand Coulee Dam and forty miles east of Portland another hydroelectric undertaking, Bonneville Dam, was built. Unlike the Grand Coulee and Boulder projects, the Bonneville Dam was not conceived as a land-reclamation improvement. It was an electric power project. But the political sponsors of Bonneville Dam did not openly proclaim the electricity purpose. Apparently fearing political reactions, they emphasized river navigation rather than production of electric energy. When the Bonneville Act was passed by Congress in 1937, navigation was the declared purpose of the project, even though the Army Engineers previously made an unfavorable report on Columbia River navigation.[23] Since there are only a few small-sized cities above Portland (Hood River and The Dalles) and the present traffic consists largely of petroleum products,[24] the need for river transportation is not large. No one can look objectively at the Bonneville project and clearly see more than one primary purpose—electricity production.

Bonneville Dam is located in a gorge where the Columbia River flows through the Cascade Mountains. It is a low dam that has no peculiar features apart from the fish ladders. Located where the water flow of the Columbia River is quite steady, the dam can produce a large amount of firm power. Transmission lines connect the Bonneville and Grand Coulee Dams. When the Bonneville Dam began to produce electricity, no large market was available. Municipal and private electric systems held the best Puget Sound markets and had adequate generating plants; private companies were firmly established in other markets. Although Bonneville rates were patterned after and were even lower than the TVA wholesale rates, municipalities did not rush to buy energy. Before the Second World War a few industries began to buy electricity. The war was a real boon to the Bonneville project because a number of new war plants, located along the Columbia estuary, bought large quantities of power. And the hopes for an industrialized Northwest, based on low-cost electricity, began to rise.

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* The Bureau of Reclamation probably cannot sell the water rights at prices that will liquidate the irrigation investment. To provide irrigation improvements for slightly more than a million acres, the Bureau now anticipates an investment cost (exclusive of Grand Coulee Dam) of about $280,000,000.[22] This is an average irrigation investment of about $275 an acre.

Even though the full capacity of Bonneville and Grand Coulee Dams is not yet utilized, the Department of the Interior has plans for the construction of more Columbia watershed dams. Engineers like to plan and build dams; project administrators want to manage larger enterprises; and civic and regional interests always can find new locations for federal investments. Thinking of an expanding Pacific Northwest, business groups, state political organizations, and the Bonneville Power Administration easily imagine new outlets for electricity. They foresee a large and diversified industrial expansion that is based on low-priced electricity; they expect more electrification of railroad lines; and they rightly anticipate more rural and domestic consumption of electricity.[25] Some of the proposed dams can improve the navigation of the Columbia and Snake Rivers; others can provide irrigation and flood-control services in Idaho, Washington, and Oregon; all of them can produce electricity.[26] Even if Congress does not approve many more dams for a long time, the current proposals illustrate the expansive temper of regional and public power interests.

The Central Valley. Next to the Columbia Basin and Boulder enterprises, the most expensive irrigation project is in the Central Valley of California.[27] This valley, which is between the Coastal and Sierra Mountains, consists of the San Joaquin Valley in the south and the Sacramento Valley in the north. It contains nearly two million acres of which about one million are irrigated. The Central Valley project was designed primarily to increase the water supply to irrigation farmers in the San Joaquin Valley where water was scarce, and where some farms were abandoned. While the San Joaquin Valley contained twice as much tillable land as the Sacramento Valley, it had only half as much water. To balance the water supply with water needs, the Central Valley project diverted water from the Sacramento River to the San Joaquin Valley. There were other water-control problems in the Central Valley. One of them was the salt water seepage into the rich farm land around the Sacramento River delta. When the water flow was low and the irrigation diversions of water were heavy, the water from the Sacramento and San Joaquin rivers did not force back the salt water from Suisan Bay. The third problem was winter and spring floods, particularly the floods in the Sacramento Valley.

The Shasta Dam and reservoir, which are located on the upper Sacramento River just below Mount Shasta, are the main parts of the Central Valley project.* Several smaller dams, which are designed basically for flood control, navigation, or irrigation service rather than electricity production, are located on the Sacramento River and tributaries of the Sacramento and San Joaquin rivers. A fifty-mile canal carries Sacramento River water to the San Joaquin River, and to the Contra Costa Canal which brings fresh water to the delta farmers and other people. Since Sacramento water now is used in the northern part of the San Joaquin Valley, the water of the San Joaquin River is diverted southward. To effect this change, Friant Dam, much smaller than Shasta Dam, was built on the San Joaquin River about 20 miles north of Fresno. From Friant Dam the Madera Canal carries water northward for the irrigation of about forty thousand acres. Another canal, the Friant-Kern Canal, extends 160 miles southward from Friant Dam to the Kern River, and brings supplemental irrigation water to a large area of developed land.

The Shasta Dam not only controls the flood waters of the Sacramento River, provides water for the San Joaquin Valley, and improves the navigability of the Sacramento River, but also produces a large amount of electricity. It has an estimated capacity of 375,000 kilowatts.† Able to produce more electricity than any other dam except Grand Coulee Dam, Shasta Dam can supply at least one-fifth of the northern California market for electricity.[30] This market now is controlled, however, by the Pacific Gas & Electric Company that holds exclusive and indeterminate franchises in many cities and counties.[31] Pacific Gas & Electric now has a temporary contract for the distribution of Shasta power, and is willing to negotiate a long-term contract for the electricity.[32] Holding the best markets, possessing exclusive franchises, and being at least a temporary distributor of the public power, this company may be able to thwart a large public power movement in northern California. Perhaps the Shasta Dam and lesser dams will become chiefly suppliers of private companies and not develop into a TVA-type of system. The Bureau of Reclamation wants a public power system—a network of transmission lines, steam generating plants for "firming up" the hydro power, and a market among California towns and rural cooperatives.[33] But it may not get the system, because Pacific Gas & Electric offers an outlet for electricity, and because Congress is not yet ready to approve widespread public transmission and distribution of electricity.[34]

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* Shasta Dam, which controls the flood waters of the Sacramento River, was not yet finished before many other water-control projects were demanded. Landowners and local business interests along tributary streams wanted flood control and irrigation improvements.[28] Congress approved six of these dams in 1944, and put the construction and management of them under the War Department;[29] other dams, which are parts of the basin-wide plans, may be approved and constructed in the future.

† The Friant Dam was built for water-control purposes rather than electricity production.

OTHER FEDERAL PROJECTS

The Boulder, TVA, Columbia River, and Central Valley improvements are vast projects, the kind of undertakings that only the federal government can afford. Federal agencies also have lesser multiple-purpose and single-purpose projects that make use of water resources. Dwarfed by TVA and other enormous enterprises, they do not attract much public attention. Yet they are parts of the public-ownership program, and a few of them are described here.

Big Thompson. Colorado farmers who live east of the Continental Divide and north of Denver use the water of the South Platte River to irrigate their lands. Before the First World War they had enough water. But when the number of irrigated acres increased and land use shifted to sugar beets and more truck products, these farmers began to experience water shortages. The shortages became acute during the dry, dusty years of the thirties. Holders of secondary water rights either were forced to curtail farm operations, or were compelled to pay high prices for available water. To supplement the water supply for more than 600,000 acres of good land, the Colorado-Big Thompson project was undertaken. A large supply of unclaimed water was available on the west slope of the Continental Divide. To bring this water to the east side of the divide, a thirteen-mile tunnel was bored through the mountains and a series of dams and canals were built. Producing electricity as a by-product of irrigation service, the dams can supply large quantities of electricity. If the potential output ever is developed, the Big Thompson project probably can add at least 50 per cent to Colorado's generating capacity.[35] Lacking immediate markets for so much power, the Bureau of Reclamation does not yet have plans for full use of the project's electricity capacity.*

Fort Peck Dam. Located near the North Dakota border in eastern Montana, the Fort Peck Dam stores a large quantity of Missouri River water. This dam can store more water than any other except Boulder Dam on the Colorado River. A large, earth-core dam, it represents about a $124,000,000 investment exclusive of electric equipment.[36] The Fort Peck Dam does not have much flood-control value; it is primarily a navigation project, and is designed to provide a six-foot channel on the lower Missouri River. This is a large investment for the limited Missouri River traffic. The investment is nearly as large, in fact, as the total investment in twenty-six navigation dams on the upper Mississippi River. Fort Peck Dam can produce a large amount of electricity. The problem, however, is not to produce electricity, but to find a market for it. Operating in a thinly populated area and being far from large cities, this dam seems to have the poorest location of all public power undertakings. The largest city within two hundred miles of the dam is Billings, Montana, which has less than twenty thousand inhabitants.

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* In Wyoming another reclamation improvement, the Kendrick project, was undertaken in the thirties. Using water from the North Platte River, which rises in northern Colorado and flows through Wyoming and Nebraska before it empties into the Missouri, this project was designed primarily to irrigate about 60,000 acres near Casper. Electricity production was a secondary consideration. The main part of the undertaking was Seminoe Dam.

Passamaquoddy. In the public power history of the country the Passamaquoddy project was interesting for two reasons: it was the only power project that the New Deal government abandoned after the construction work started, and it was designed to use tidal waters. Located on the Maine coast just below the New Brunswick border, Passamaquoddy Dam was expected to produce electricity with the high Maine tides. Private electric companies were interested in such a dam, but according to their managers the construction plans were set aside because the dam site was so far from large Eastern markets for electricity. Congress appropriated $7,000,000 for preliminary work, and construction of the project began in 1935. Using a series of dams, engineers expected to generate electricity as tidal waters passed from the Bay of Fundy into Cobscook Bay, a part of Passamaquoddy Bay. And the plan called for electricity generation, too, as the tide went out. Sometimes this project was praised; [37] more often the public, like private electric companies, ridiculed it. When the $7,000,000 was spent, President Roosevelt did not press Congress for additional appropriations.

Planned Projects. Floods are common along innumerable American rivers and creeks. And the people who live on or near these streams always want to prevent the floods. Seeing much federal spending for water-control projects, the farmers and urban groups in nearly every small and large watershed also want a flood-control dam and an artificial lake. Their congressmen sponsor the flood-control projects, and the Army Engineers plan the improvements. In the Arkansas Valley, for example, many dams are planned on the Arkansas, Red, St. Francis, White, and Grand Rivers; [38] several dams already are finished in the valley. Even if these are built primarily for flood control, they still can produce large amounts of electricity. More water-basin improvements are planned, too, for the irrigation farmers in Western states. The Department of the Interior talks about several billion dollars' worth of new projects—enough undertakings to reclaim or to bring supplemental water to more than 15,000,000 acres of Western land, and to produce an indefinite but large amount of electricity.[39] In 1945 this department had an inventory of more than four hundred projects, and Congress already had authorized more than one hundred of them.[40] For example, a large reclamation improvement, the Mountain Home project, is planned east of Boise, Idaho; it will cost between $200,000,000 and $300,000,000, will irrigate 400,000 acres, and eventually will have an electricity capacity of about 500,000 kilowatts.[41] And the administrators of the TVA, Columbia Valley, Central Valley and other established projects, who want to broaden their operations, have plans for more dams and reservoirs.

Many water-use projects are proposed, but only a few of them equal the size and significance of the St. Lawrence Seaway. This waterway improvement was proposed frequently after about 1900, and was investigated and discussed during the twenties.[42] A treaty between the United States and Canada, which authorized construction of the waterway, was signed in 1932, but it failed to get the necessary two-thirds vote in the Senate. Even President Roosevelt, who wanted to sell St. Lawrence electricity in New York state, was unable to start the project before or during the Second World War. If the present plans ever are carried out, the St. Lawrence Seaway will have a minimum channel depth of twenty-seven feet instead of the present fourteen-foot minimum.[43] The Seaway's dams will have an electricity capacity of 2,000,000 kilowatts; half of the electricity will go to Canada, and the other half will be sold in American markets. And the whole project probably will cost more than $400,000,000. As the plans stand now, the Power Authority of the State of New York, a state agency, will buy the American share of the electric plant, distribute electricity in New York state, and sponsor a public-ownership program. Business and shipping interests, particularly in New York City, do not want to lose ocean traffic, and private electric companies naturally do not want to compete with a public power system. These opponents of the Seaway say that the investment cost is underestimated and that there is no electricity shortage in New York. Refuting these charges, the New York supporters show how the demand for electricity is increasing, and how the St. Lawrence improvement can reduce the price of electricity. And the farmers of the Dakotas and Minnesota as well as the industrialists in the Great Lakes area argue that the prospective reductions of freight rates are large enough alone to justify the seaway.

No water-basin project is planned or constructed that has the scope of the Missouri Valley system.[44] Including all or parts of ten states, this great valley stretches from the Rocky Mountains of Montana to the Mississippi River at St. Louis, from southern Saskatchewan to Kansas and the Ozarks. The area is more than ten times as large as the Tennessee Valley; the Missouri River and its many tributaries present larger and less easily solved problems of water control than the Tennessee River. Numerous river improvements already are in operation; the Kendrick irrigation and power project in Wyoming, Fort Peck Dam, the hydro plants of Nebraska, many small irrigation projects throughout the area, a navigation channel on the Missouri River as far as Sioux City are among the present improvements. These are small parts of the controls that now are envisioned for Missouri Valley water, small parts of the dams and channel improvements that will be built in the next twenty-five years. Electricity production, a secondary purpose, can be greatly increased; a better navigation channel can be provided on the Missouri River; much land can be irrigated in the Dakotas, Montana, and Wyoming; and destructive floods, which can do as much as $50,000,000 damage in a single year,[45] can be curbed.

One problem in the Missouri Valley is the management of land and water uses. At first the flood-control and irrigation plans were developed separately, even though integrated planning seemed to be a more intelligent approach to the problems. Preferring several large dams on the Missouri River and smaller dams on tributary streams and planning primarily for flood control and river navigation, the Army Engineers had a plan that satisfied the people of the lower Missouri Valley.[46] The Bureau of Reclamation plan, on the contrary, appealed to the upper-basin people, because it proposed many irrigation reservoirs and water for about five million acres.[47] This was a place for a central governmental authority such as the TVA. But the Army Engineers and Reclamation Bureau, wanting to avoid the establishment of a Missouri Valley Authority, hastily put their plans together and proposed joint administration of the project. State and local governments also oppose the creation of an MVA. They do not want a Missouri Valley Authority that is an autonomous planning agency, has broad social controls, and may intrude on local and state governments; the politicians and farmers of the Missouri Valley ask for more than a billion-dollar investment by the federal government, but they do not wish much federal management in their region.[48]

Another general problem is the scope of land and water control in the Missouri Valley. Some improvements are certain to be financed by the federal government and construction work already is in progress on the Republican Dam in Nebraska, the Garrison Dam in North Dakota, and other improvements, but the ultimate limits of the project cannot be discerned at this time. We will know more about its shape in fifteen or twenty years. Government attention is centered now on flood control, irrigation, and river navigation. Later a public power program, based on the available generating capacity of river dams, is certain to start. Even though much of the valley has a sparse population, limited manufacturing, and only a few large urban markets, public power will expand. Given funds and political freedom, public electric service can be counted on to spread over the whole valley—over much of nine or ten states. Later, too, a widespread program of soil control and farming improvements is likely to be proposed, because the valley contains much of the country's dust bowl, eroded land, and marginal farming. Growing dam by dam and broadening its purposes as it grows, the Missouri Valley project can be the largest and most expensive undertaking of the federal government—larger than the TVA or even larger than any two water-basin projects. Only a cost-minded, tax-troubled, and cautious Congress can restrain the regional and Washington interests who have big eyes as they look at the Missouri Valley.

NONFEDERAL PROJECTS

During the thirties a number of multiple-purpose projects were constructed by state agencies. They usually were financed by the Public Works Administration and the Reconstruction Finance Corporation, but they were not managed by federal authorities. Like federal projects, they, too, are a part of the public power movement.

Santee-Cooper. The South Carolina Public Service Authority, a state agency, was created in 1934 and acquired control later of the Santee-Cooper project. Where the Santee River was only six miles from the Cooper River, a canal was built to divert Santee River water to the Cooper River. This canal provided a looping waterway—forty-five miles inland on the Cooper River and one hundred miles back to the coast on the Santee River. But the main purpose of the project apparently was power production rather than river navigation. A hydro plant was built on the Cooper River, and electricity was generated with water that was diverted from the Santee River. Like many other public power systems, the South Carolina Authority did not have an electricity market when its plant was completed. In 1943 it tried to buy two private electric systems which a holding company was compelled to sell in connection with corporate integration requirements. A price of $40,000,000 was agreed on, and the PWA was willing to provide the cash. But the South Carolina Supreme Court forbade the acquisition, saying that the system did not have authority to acquire private electric plants.

Texas Dams. Water-control projects in Texas are managed primarily by state agencies.* Although the main purpose of river improvements on the Lower Colorado, Brazos, Sabine, Guadalupe, and other rivers is flood control or irrigation service, the planned and finished dams can produce electricity.[49] One agency, the Lower Colorado River Authority, has two flood-control dams in the neighborhood of Austin; they are the Buchanan and Marshall Ford dams. Another agency, the Brazos River Conservation and Reclamation District, has plans for twelve dams. The first of these, the Possum Kingdom Dam, is located on the central Texas plains, west of Fort Worth. These and other Texas projects produce or plan to produce considerable quantities of electricity. But a strong public-ownership movement, resembling the TVA or Nebraska programs, is not yet evident in Texas.

The Grand River Dam Authority. Created by the Oklahoma legislature in 1935, the Grand River Dam Authority built the Pensacola Dam with PWA funds.[50] This dam was the first of several proposed dams on the Grand River, a tributary of the Arkansas River. Between $15,000,000 and $16,000,000 was invested in the Pensacola Dam and reservoir, and another $2,000,000 was invested in electrical equipment.[51] Located in a sparsely settled, drought-stricken farming area, this flood-control and power project lacked a good electricity market when the Pensacola Dam was finished in 1941. A few months later the dam was taken over by the War Department, and produced electricity throughout the war for a near-by ordnance plant. Looking toward industrial and rural sales of electricity, the Southwest Power Administration (an agency of the Department of the Interior) made plans during the war to build a network of transmission lines and to interconnect the Denison, Pensacola, Norfolk, and other public dams that may be constructed in Texas, Oklahoma, and Arkansas.[52]

Little TVA. Nebraska, the home state of Senator George Norris, has a notable public power system. Although this system does not have gigantic dams, it ranks next to the TVA in the scope of its operations and the advancement of public ownership. Three hydroelectric dams, financed with PWA funds, produce electricity for a public distribution system. Two of the hydro projects provide irrigation service as well as electricity; the other produces electricity alone.† The Platte Valley project, which transfers the water of the North Platte River to the South Platte River, produces electricity at the Sutherland Dam near the city of North

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* One important project, the Denison Reservoir, was built during the thirties by the Army Engineers. This reservoir was constructed to control the flood waters of the Red River.

† The official titles of these projects are: Platte Valley Power and Irrigation District, Central Nebraska Public Power and Irrigation District, anad Loup River Public Power District.

Platte.[53] After the water passes through the electric generating plant, it is used to irrigate about 175,000 acres of Platte Valley land.

The Tri-County project, which is located in central Nebraska, stores the water of the North Platte River in the Kingsley Reservoir. Water from this reservoir passes through three electric generating plants on its way to irrigated farms. If the present plans are carried out, the Tri-County project can furnish irrigation water for about 220,000 acres of land. The third hydro project is located near Columbus in east central Nebraska. It has two hydro plants on the Loup River that rises in the Nebraska sand hills. Since the Loup River has a fairly steady flow, this undertaking does not have storage reservoirs. Before the water goes to the hydro plants, the silt is removed in a settling basin. Then a twelve-mile canal carries the water to the first generating plant; thereafter another canal takes it to the other generating plant near Columbus.

At first the three hydro districts, in which the federal government invested about $75,000,000, did not carefully coordinate their electric operations. In 1940 they pooled their power resources.[54] Each district retained its board of directors, but the power systems, including the transmission lines as well as the hydro plants, were coordinated and put under the general managers of the three districts.* This organization is called the Nebraska Public Power System, or the Hydro Pool. It is devoted, for the most part, to production and transmission of electricity. Although the Hydro Pool sells some electricity directly to cities and rural cooperatives, most of it goes to the Consumers Public Power District, the public distributor of much Nebraska electric service.

In 1939 the Consumers Public Power District was organized to acquire and operate electric distribution systems. Selling $47,000,000 worth of bonds in public capital markets, the Consumers District purchased nearly all the private electric properties in Nebraska. Some of the acquired distribution systems were sold to municipalities; a few were leased to cities and one hydro district; but the Consumers District retained ownership of nearly all the distribution and transmission properties. The Consumers District is divided into two systems. One is located in the western end of Nebraska, and now is supplied from steam and internal-combustion plants. The eastern system, which has most of the plants and customers, is supplied chiefly by the Hydro Pool, and partly by the Consumers District plants. Buying electricity under a thirty-year contract, the Consumers District pays the Hydro Pool an average price of about 5 mills a kilowatt-hour.

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* California passed the first law for public power districts in 1913, and eighteen states had such laws in 1940.[55] While the laws are not alike in all states, public power districts always are political subdivisions of a state, are managed commonly by an elected board of directors (some laws provide for their appointments by the governors), are planned generally as self-supporting systems, sell bonds that are not obligations of the state governments, and usually distribute service beyond the limits of single municipalities.

In 1946 the Omaha Public Power District acquired the remaining property of the Nebraska Power Company, and now the Nebraska consumers buy electricity from public and cooperative plants rather than private systems. As late as 1935 the electric service of Nebraska was performed primarily by private companies; now the Hydro Pool, Consumers District, Omaha District, rural cooperatives, and municipal plants are predominant. The Tri-County, Platte Valley, and Loup River projects concentrate on hydrogeneration of electricity. The Consumers District produces electricity in former private plants, transmits and wholesales electricity to municipal and rural cooperative systems, and sells directly to consumers in many towns. Municipal plants, generating some electricity in their own plants and buying additional electricity from the Consumers District, operate in other Nebraska cities. Like Tennessee, Nebraska is a leading center of public ownership in the electric industry.

MANAGEMENT OF REGIONAL PROJECTS

New undertakings in American government, the water-basin projects are managed in several different ways. The hydro plants and Consumers District in Nebraska have governments of their own, and are almost completely free from Nebraska state government. And the TVA, managed by a board of directors, is a government corporation that has considerable independence from Washington government, though it is subject to federal accounting controls and is dependent on Congressional appropriations. But the TVA form of control is not copied for other federal projects; reclamation undertakings are under the Interior Department, and flood-control dams are built and supervised by the Engineers Corps of the Army. Departmental control is dominant among the federal enterprises.

The Nebraska Controls. Organized under a general statute for irrigation and public power districts, the Nebraska projects are separated from the state government. More autonomous than any federal improvements, each of the hydro districts is managed in a home-rule manner. Separate boards of directors, which are chosen by the voters of the districts, administer each of the Platte Valley, Tri-County, and Loup River projects. These directors have authority to incur indebtedness, prescribe accounting practices, choose employees, and fix the prices of electricity and irrigation service; they are as free as the directors of a private corporation. The management of the Consumers Public Power District, the statewide distributor of electricity, is chosen in a slightly different manner, Seven directors, who serve six-year terms, are elected by the voters from seven state districts. Like the directors of hydro districts, the directors of the Consumers District can issue revenue bonds, acquire property, fix prices, provide accounting controls (though annual audits must be submitted to the State Auditor of Public Accounts), and hire employees.

Neither the Nebraska unicameral legislature nor any state department exercises direct control of the hydro districts, the Hydro Pool, the Omaha District, or the Consumers District. These projects are not dependent on the legislature for funds. Free to borrow in public markets or from federal lending agencies, the directors determine the limits and locations of investments. And they also determine electricity prices and electric service standards in many Nebraska cities and towns. The state of Nebraska does not require the districts to centralize their management; each district is a largely autonomous agency. A state authority, coordinating the planning and management of the several districts, is not under consideration, though such an integrating agency affords a way to economize the use of Nebraska's somewhat meager water resources.

The TVA Administration. Congress is not yet ready to create a separate government corporation for each water-basin project. Only one of these semiautonomous agencies, the TVA, is set apart from federal government departments and has much freedom to manage its own affairs. Established during the most expansive period of New Deal government, the TVA is controlled by a board of three directors who hold office for nine years and are appointed by the President with the consent of the Senate. These directors control the construction work, let contracts (though they are required to advertise for bids), use the right of eminent domain to acquire private property, and fix prices for electricity and other services. Being free from civil service controls, they fix their own personnel requirements, determine wage and salary rates, and hire or dismiss employees. Congress and the President have periodic control of the TVA in connection with appropriations. Even so, the TVA obtains large, lump-sum appropriations without much trouble. But the TVA lost some of its political freedom in 1945. Accepting a proposal by the conservative Senator Byrd, Congress authorized audits of all government corporations by the General Accounting Office. And more TVA autonomy may be lost in the future.* At least some Southern politicians, wanting more patronage outlets and power, are particularly anxious to control the numerous jobs of TVA.

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* The TVA fought off these accounting controls during the thirties—during the time when it was a favorite showpiece of the New Dealers and an outstanding American example of experimental government.[56]

As its supporters like to say, the TVA is not "run from Washington." Controlling operations that are spread over several states and are too large for any single state, it avoids an old trouble of federal government —centralized bureaucracy. The directors are close to the project; they are near the power, flood-control, navigation, and agricultural problems of the valley, and have immediate contacts with the people of the region. Another benefit is realized from the political freedom: the TVA makes only a few, unavoidable concessions to spoilsmen.[57] A third advantage is the efficiency of management; the directors can make investigations, decisions, and innovations immediately, and do not have to wait for approvals from Washington offices. Finally, the Authority unifies the management of flood control, electric service, navigation, and agricultural problems that otherwise might be divided between several government departments.[58] Yet, even though unified, efficient, and regional management is realized and Washington bureaucracy is avoided, the TVA form of control still is not used for other projects. A separate authority was rejected for the Missouri Valley improvements where water-control problems are more diverse and more difficult than in the Tennessee Valley. Congress relies on departmental controls—even divided departmental management of some large projects.

Government Department Controls. Two federal departments control many multiple-purpose improvements. One of these is the War Department, which plans and operates some projects through the Corps of Engineers. If the projects are exclusively or predominantly flood-control or navigation improvements, the Engineers Corps studies them, supervises their construction, and operates them after they are completed. The Engineers Corps now administrates the Denison Dam in Texas, Fort Peck Dam, and many lesser dams. And the War Department is certain to control many more enterprises, unless the flood-control program is shifted to some other department. If federal dams are built in seventeen Western states and are designed to reclaim arid land, the Bureau of Reclamation of the Department of the Interior controls the electric operations as well as the irrigation service. Experiencing a great increase in electric service, the Department of the Interior added a separate Division of Power in 1941. This division formulates and coordinates the electricity policies of the Interior Department, encourages the "most widespread use of electricity in the public interest," disseminates information about policies to department bureaus and information offices, and supervises the application of policies.[59] But the Interior Department controls more than the electric operations of irrigation projects. It is authorized to transmit and sell the electricity that is produced by flood-control and navigation dams of the War Department. Finally, the Bonneville Power Administration is a separate agency of the Interior Department, and has an administrator who is independent of the Bureau of Reclamation.*

The Interior and War Departments provide administrative lines from the President to river improvements. Yet this is not clearly the most efficient way that the federal government can manage the expansion and operation of water-basin improvements. Neither the Secretary of the Interior nor the Secretary of War commonly is a man who has extensive knowledge of water-control problems. Since the Interior and War Departments have many parts and functions, the secretaries usually must trust the judgments of the reclamation officers and the Army Engineers. The Secretary of the Interior administers many activities other than the modern river improvements. And the Army certainly has far more important jobs than the construction and operation of flood-control and navigation dams. Only political history and peacetime jobs for engineers, indeed, seem to explain the War Department management of flood and navigation projects. This administrative arrangement has another fault wherever a large valley contains several kinds of water-control problems: it is a source of possible confusion and conflict. The two departments have separate objectives, for instance, in the Missouri Valley;[60] one wants to irrigate much land in the upper valley, and the other wants to build large flood-control dams and improve the channel in the lower valley.† And there is another possible source of conflict in California's Central Valley: the Interior Department operates the main improvements on the Sacramento and San Joaquin Rivers, but the Army Engineers are authorized to construct and manage lesser dams on tributary streams.‡

A Place for Central Management. The federal government clearly does not unify the management of its water-basin program. TVA plans and produces for a single valley; the Engineers Corps concentrates on flood control; the Bonneville Power Administration is a separate agency in the Interior Department that is devoted to electric service; and the Bureau of Reclamation emphasizes irrigation improvements, and is destined to become the nation's largest distributor of electricity unless the division of administrative authority is revised. No administrative agency studies all proposals for additional federal investments, choosing between

* The Federal Power Commission also has some supervisory control of the Bonneville Power Administration. It determines the joint investment allocations, and passes on Bonneville wholesale rates.

† They clearly did not agree on the Missouri Valley improvements until a proposal for a Missouri Valley Authority forced them to put the two plans together.[61]

‡ Even if flood control is a significant problem in the Central Valley, irrigation still seems to be the main purpose of the improvements.[62] Yet the irrigation farmers testified against financial or technical control by the Bureau of Reclamation.[63] Perhaps they foresaw lower prices for additional irrigation water, because the dam and reservoir investments of flood-control improvements were not chargeable to land users.

projects and trying to fix the best limits of public production. Nor does any single agency supervise the electric price and service policies and seek a common national pattern for them. Each government agency as well as numerous regional and local groups present their plans to Congress and ask for funds. And Congress, working through several committees and lacking expert advisers, must sift the plans for new projects, look beyond the strictly regional and bureaucratic interests, and shape a national program of water uses. To put nation-wide interests ahead of regional demands and to economize the public investments, the federal government can create a new department that is headed by a cabinet officer; it can be called, say, the Department of Water Resources. Under such a department the river improvements in each valley may be managed directly by a separate authority, but all the regional authorities are controlled by the federal department. This plan is certain to be opposed by the persons who want a TVA-type of organization in every water basin; they prefer regional control, and apparently think that Congress can provide the national integration of policies. It is certain to be opposed, too, by the Interior and War Departments because they lose political powers. Yet, as the water-control program expands, the need for national planning and management becomes more evident.

Chapter 32

Investment Conditions for Multiple-purpose Projects

THE FEDERAL government owns or has loans on several billion dollars' worth of joint-purpose projects. These are our most notable examples of socialized investment—larger than the postal system, more permanent than the large public investments in manufacturing plants during the Second World War, and socially more significant than other kinds of public investments because they represent probable forerunners of an expanding public production as well as great and experimental innovations in their own right. Sometimes electricity production is the main purpose of the undertakings, and in other instances electric service is secondary to the flood-control and irrigation objectives. A new era in public power production is started. And the full limits of public investment in these electricity-producing projects are not yet realized. The Bureau of Reclamation wants to build many more irrigation-power projects; such large undertakings as the St. Lawrence waterway still may be constructed; and the inhabitants of many river basins are looking toward the time when their representatives can obtain flood-control improvements. Administrators of the TVA, Columbia Basin, and many other existing projects have long-range plans for additional dams and reservoirs. Public power production will grow. But the growth cannot be clearly foreseen as long as public investment decisions are not based on firm, factual rules.* Unlike private electric investments, public investments are controlled more by social and political considerations than by prospective revenues and costs. The limits of public power production cannot be exactly determined, though some political and administrative conditions of the undertakings can be identified.

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* Describing a few general investment conditions as they actually seem to be and showing sometimes how high political scruples are not behind the investment plans for multiple-purpose undertakings, this chapter can be misunderstood by some readers. It is not an attack on public investments; the critical approach does not prove hostility to public ownership. Again, as in the preface and Chap. 29, I say that I see nothing wrong with the idea of public ownership in democratic government, but I do see deficiencies in some cases of public production and management. Indeed, I am anxious personally to see more public projects, even though the investments are not likely to be directed at all times so that the interests of the nation and the future of the public-ownership movement are best served.

GENERAL CONDITIONS OF PUBLIC INVESTMENTS

The Supreme Court can fix certain legal limits of public power production. It can prescribe the limits of the public "invasion" of private electric markets. And further conditions of the public investments are the decline of capitalism, regional influences in national politics, the public works policy of Congress, the size of the federal debt, and the permanency of the improvements. Yet no one can say just how much effect each one of these general conditions has on public investments in the projects that produce electricity. Rather, these are simply some conditions that underlie the general pattern of project investments.

The Legal Right. The Supreme Court does not forbid the construction or operation of any regional project. All the important decisions of the Court concern the rights of the TVA. The impact of the TVA power program hit chiefly the Commonwealth & Southern companies, the affiliated companies that practically blanketed the states of Tennessee, Georgia, Alabama, and Mississippi with electric service before the TVA began to develop. These private companies challenged the legal rights of TVA and its affiliated distributors; they initiated a number of cases against either the Authority, or the cooperatives and municipal plants that distributed TVA electricity. In the Ashwander case, which the Supreme Court decided in 1936, a stockholder of the Alabama Power Company challenged a TVA purchase of the company's property.[1] In reality the TVA sales of electricity from Wilson Dam were challenged.* Except for a lone dissenter, Justice McReynolds, the members of the Court were not willing to prohibit TVA sales of electricity in any market.

In a later case, which was known as the Eighteen-companies case, the Supreme Court was asked to decide whether the TVA could build additional dams and could sell their electricity output.[3] Unlike the Muscle Shoals development that was under consideration in the Ashwander case, these new dams were not built as wartime improvements. The private companies emphasized the duplication of their plants by TVA, and demanded a Court ruling on the limits of governmental functions. But the Court did not define the limits of public investments. Instead, it discussed whether the private companies were privileged to be free from public-plant competition. The companies held nonexclusive franchises, and could not claim freedom from rivalry on this count. State statutes did not prohibit competing plants; even if they did, the Court did not believe that the state could prevent the operation of a federal agency. Nor did the Court uphold the argument of the companies that the Public Works Administration forced municipalities to buy electricity from the TVA.

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*In 1934 the Supreme Court upheld a license tax (3 per cent of gross revenue) which the city of Seattle levied on a private electric company, even though the city also operated an electric system. Justice Stone said, "The injury, which the appellant fears may result, is the consequence of competition by the city, and not necessarily the imposition of the tax. Even without the tax the possibility of injury would remain, for the city is not bound to conduct the business at a profit."[2]

Changes in Capitalism. Public investments in electricity-producing projects are an expression of a changing capitalism—of a declining public faith in private money-making as a means to jobs, prosperity, and general social efficiency. After the First World War the deterioration of capitalism—the economic system of private property, privately controlled production, and private exchange of goods and services—was evident. That decay advanced a long way after 1920, particularly during the depression decade of the thirties. Showing large deficiencies of purchasing power and leaving many persons unemployed, capitalistic business functioned inefficiently after 1930 and lost much of its earlier pre-eminence.[4] At the same time the corporate, labor, and farmer groups were becoming more united; they did not want the competition of competitive capitalism. Managerial control of production, particularly in the heavy industries, was concentrated into fewer and fewer hands; the urban masses organized themselves into powerful industrial unions, abandoning market control of wage rates and asserting their own judgments of what the right wages and working conditions were; and American farmers, lobbying through the American Farm Bureau and Farmers' Union, used political means to avoid competitive control of farm prices—to get crop-control plans and higher incomes. These concentrations of economic and political power, as well as economic collapses and depressions, were the twentieth-century threats to economic liberalism.

When the great depression of the thirties revealed the limitations of capitalism and threatened a complete collapse of the system, politicians and public administrators naturally gave up some of their reliance on private enterprise. Not only did they undertake more regulation of private business, but also they were more willing to expand public production of goods and services. They even were willing to make public investments in enterprises in which private investors also were interested. The electric industry was an attractive field for public investments. Being a public utility, electric service had a greater public importance than other services that were not in the public utility class. Municipal ownership of electric and other utility plants, furthermore, provided a precedent for federal power projects. But, most of all, the federal government could combine electricity production with the purposes of river navigation, irrigation, and flood control. The federal government could do something that the private electric companies could not do: it could utilize fully the water resources of a river basin.

Although the federal government already is an important producer of electricity, Congress is not yet determined to nationalize the electric industry. It does not say that nationalization of this industry can be expected at some future time. At the same time the public policy does not question continuation of TVA, Boulder, Columbia Basin, and many other established sources of public production. More investments are in sight, too, as long as the public sales of electricity continue to expand—as long as plant construction ahead of market development follows the TVA experience and seems to justify further chance taking.* Both public and private production are accepted; a final, absolute choice is not made between public and private service. In this experimental, indecisive political situation the issue of a nationalized electric industry is set aside. Meanwhile more projects will be built; more private companies and private investors will be disturbed by the public power expansion. The nation will move closer to the nationalization of the electric industry as Congress approves more projects, and as the scope of existing projects expands. Yet the extreme limit of nationalization may not be reached as long as capitalism lives.

Earnings Objectives. When a private company invests in new equipment or a new service area, it commonly wants a revenue increment that is as large at least as the expected cost increment. Since private firms want to enjoy financial success, profits are paramount. When public projects are planned and developed, Congress and public administrators also take account of the prospective revenue and expenditures. Congressmen usually prefer public investments that can be liquidated out of electric or water revenue. Because the prospective electric and water revenues seemed to be large enough to liquidate nearly all the public investment, Congress and President Hoover readily approved the Boulder project. When the TVA was created, it was required to liquidate part of the public investment out of electric revenue. And state agencies and power districts, which borrowed from the PWA and RFC, were expected to

* Just because a remarkable sales growth and an efficient management confirmed the strong faith of early TVA supporters, every project cannot count on the same success. As the public program is extended farther and farther into sparsely settled and less promising industrial areas, the chance of uneconomical investments increases and some of the social attractiveness of public power production is likely to be lost. Wanting to be controlled by some economic considerations as it makes investments, Congress will try to limit plant expansion in the areas beyond where the private investments now are concentrated. Consequently, if the public power program is to continue its growth, the federal government must turn sometime to the acquisition of private plants rather than further construction of dams in mountainous and arid regions.

liquidate their loans out of the electricity or the irrigation revenues. Flood-control and navigation improvements are given to property owners and business interests, but the political temper of the nation does not yet approve consciously planned, permanent subsidies for electricity customers.

Even though public authorities study the revenue prospects of power-producing projects, they do not measure the revenue prospects so closely or so conservatively as private companies do. Unlike the private firm, the public project is not required to pay interest and dividend obligations every year. Amortization of the public investment can be deferred for a decade or more. It can be deferred until the market for public electric service develops—until buyers finally contribute enough revenue for the investment amortization. Most multiple-purpose projects, in fact, have unused generating capacities for at least several years after they first begin to sell electricity. They are not built to meet simply the immediate demand for electricity. Rather, they are built to provide flood-control, irrigation, and navigation services as well as electric service. If a project such as TVA provides flood-control, navigation, and power services, public authorities have a choice between either unused generating capacity or inadequate flood-control and navigation services. Because the choice usually is adequate flood-control, irrigation, or navigation improvements, an unused generating capacity is a common characteristic of multiple-purpose projects.

Since multiple-purpose projects are not built in a piecemeal manner and are designed to utilize all water resources in their river basins, the administrators of the projects often are hard pressed to find immediate markets for electricity. They are in less comfortable financial positions than most private companies. Private electric companies expand their generating plants as more sales are anticipated or experienced. But the public plant is built first; then the market for electricity is sought. Lacking balanced relations between plant capacities and demands for service, project administrators offer their electricity at low prices, and try to attract new consumers and to induce more consumption by the old buyers. Sometimes the administrators have good luck: buyers spend more for electricity at the low prices than they did at the former private prices. Yet, when all projects start off with much unused electricity capacity, some of them are likely to realize only partial liquidations of their public investments.* At least the amortization of public investments is not a certainty for water-basin improvements.

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* Failing to recover the total costs of electric service, the federal government must divert tax revenue to cover the deficiency. In this way the public power program can redistribute some of the national income; persons and corporations along the Atlantic Coast and in the North Central states, for instance, contribute to the improvement of the water basins and provide pricing benefits for persons and business firms in these areas.

Public Works Programs. Many of the existing multiple-purpose projects were started as parts of the public works and deficit-spending program of the depressed thirties. The public works program originally had two economic objectives. Being a part of the unemployment relief program, it provided jobs for unemployed persons. At the same time a process, which was called "pump priming," was supposed to be set in motion; when the federal government invested in public works, a stimulation of private investments was expected. Unless they took the place of private expenditures, public investments increased expenditures on other goods and services as much at least as the amount of the public investments. These investments had an even greater effect on the flow of national income; the public investments increased the income flow more than the amount of the investments alone—the increase in income was a multiple of the investments. If this increase in expenditures on goods and services was large enough, the public investments stimulated private investments and the pump was primed.[5] But the actual American experiences with pump priming were disappointing; the pump did not prime so well that the flow of private investments was large.[6] And after 1936 the purposes of the public works program were restated: the program compensated for deficient private investments, and provided jobs for unemployed laborers.

The public works investments are not ordinary public investments in power-producing projects. Public ownership of electric generating and transmission systems is not the main political consideration; reduction of unemployment rather than public production of electricity is the reason for the public spending. Nor does the federal government always insist on self-liquidating investments. Government outlays for public works are expected to reduce (or eliminate) unemployment, to generate national income, and to maintain the functioning of the economic system. Led by Alvin Hansen, one group of economists wants to supplement private investments with public investments when the private investments are less than the private savings.[7] If decreases in private investments are not accompanied immediately by equivalent decreases in private savings (or increases in consumption expenditures), the decreases in investments are translated into less employment and less national income. To maintain employment and income, the federal government must increase its expenditures. When this sort of public investment policy is followed, the effects of public works expenditures on the national employment and income are more important than the effects on private electric companies.

For the present, however, geographic redistribution of income does not attract direct Congressional attention, and does not have any apparent effect on the investment plans.

And the speed and timing of public works investments are more significant than careful studies of public investment risks.

When private investments begin to decline and another depression is in sight, the federal government is likely to undertake another large program of public works investments. This is the way to keep capitalism alive despite a collapse in private investments. It is a way to avoid the unemployment, the low national incomes, and the general deflation for which capitalism is so severely criticized. Preserving private enterprise and some opportunities for private investments, a public works program is beneficial to private investors and managers as well as laborers. If an economic depression spreads over the country, most economists and political leaders probably can agree that a public works program is necessary. But agreement on the timing and magnitude of public investments is not certain. Some politicians and economists, clinging to the laissez-faire idea of "automatic" adjustments, want to withhold the public spending until the economic contraction is well advanced or is complete. They want to stimulate a recovery, but they do not try to escape a depression. Other persons, who are guided by Hansen's reasoning, want to make public investments as soon as the private investments begin to decline. Seeing any economic contraction as a loss of production and consumption, they do not want any decreases in employment and national income.

Another public works program is certain to provide the country with more multiple-purpose projects. Water-basin improvements have a wide public appeal; a single project can satisfy the desires for flood protection, river navigation, low electric rates, and even irrigation water in the Western states. Yet these projects are not always well suited to the timing and locational requirements of a public works program. A drainage-basin improvement frequently is located in a sparsely settled area; it is not close to the centers of much industrial unemployment. Unless the unemployed laborers come to the project, the sites of these public works are poorly located for direct unemployment relief. And a large project, such as TVA, centers the direct unemployment relief in a single region. Further difficulties are encountered in the timing of public expenditures. When a large multiple-purpose project is planned, specific approval of Congress may be necessary. Or irrigation improvements, like those of the Sutherland and Tri-County districts in Nebraska, can be delayed until the landowners sign water-purchase contracts. Then the construction work on any large dam and reservoir is spread over at least two or three years. Since these projects usually are not constructed quickly, public works authorities cannot readily adjust public investments to changes in general business conditions. But when politicians control public works programs, these limitations do not prevent investments in large, multiple-purpose undertakings.

Size of the Federal Debt. Because the federal government has a large debt and is troubled to find tax revenue, Congress may withhold some investments in multiple-purpose projects. When most of the existing projects were started, the federal debt was less than 40 billion dollars. To many people who were apprehensive of both private and public indebtedness, this seemed to be a large, recklessly incurred obligation. Compared with the current federal debt, the prewar debt was a moderate sum. During the Second World War the federal debt increased to about 275 billion dollars, and became the nation's largest fiscal problem. Trying hard to collect tax revenue and to pay interest charges on a large public debt, Congress is likely to be cautious about investments in more multiple-purpose projects. The war debt is a new limitation of public power production.

Economic reasoning is divided on the burdensome character of the federal debt. Even though the federal government still can be expected to pay interest on the debt and to borrow more funds, some economists believe that the present debt is likely to prove burdensome.[8] To reach this conclusion, they emphasize the general political and institutional conditions that are connected with a high level of taxation. They center attention on tax frictions, telling how taxes annoy people, affect private investments, and disturb the functioning of the federal government. These economists want a cautious plan of debt expansion. Another group, which again is led by Alvin Hansen, shows how additional indebtedness is not burdensome as long as full employment is maintained.[9] The expectation or assumption of full employment (allowing for some transitional unemployment) is basic in their case. When the private investments decrease and the federal government sustains full employment with public spending, the Hansen group demonstrates how the ratio of federal debt to national income, which is an objective measure of the debt burden, is not expected to worsen. They anticipate a growth in employment and national income of 2 or 3 per cent a year.[10] This growth is anticipated (assumed) because technical innovations and population growth are anticipated. Since the rate of growth for employment and income is expected to be at least as large as the rate of debt expansion, the new debt is not more burdensome than the old debt.* A public spending program maintains full employment, and does not increase the debt burden, whereas a decline in investments creates unemployment and makes the federal debt more burdensome.

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* The crux of the Hansen case is the assumed objective of full employment, and the anticipated growth of national income and employment. If attractive technical innovations are not plentiful in some year or decade or if private persons and companies greatly restrict their investments for other reasons, the government must make large expenditures to maintain full employment; the rate of debt increase can be larger than the rate of

Congressmen are more likely to be influenced by general fiscal considerations than by the full-employment case. Presented to the lawmakers, the Hansen reasoning has the disadvantages that it is done by economic experts, and that it sounds too good to be true. Conditioned by a conservative political and business environment, Congressmen usually have an aversion to large amounts of indebtedness. That belief in frugality is not easy to overcome; at least the reasoning of economists may not shake it. And Congressmen feel tax frictions constantly. They hear complaints every day about complicated income taxation and exorbitant or unfair taxes. Feeling the widespread opposition to taxes, they seem to be convinced that families reduce consumption expenditures to pay income taxes, that taxes lower the real income of the country. And they are reminded frequently that a high rate of income taxation restricts private and corporate investments. Consequently many Congressmen want to avoid increases in the federal debt. Decreases in the national income and employment can progress a long way before Congress, getting funds from loans or tax revisions, makes substantial investments in a public works program. A cautious plan of public spending can be expected until the specter of widespread unemployment faces the lawmakers. Congress is likely to search for self-liquidating undertakings until the political menace of a severe economic collapse forces them to forget their debt and tax worries—even forces them to imagine prospects of self-liquidating improvements.

Regional Benefits. Legal rights, the changing political attachments to capitalism, earnings objectives for public enterprises, public works programs, and federal fiscal problems are national conditions of water-basin investments. Some of them facilitate further investments; others restrict the Congressional appropriations. These are not all the conditions. Regional interests, operating apart from national interests and being represented by legislators or government bureaus (e.g., the Bureau of Reclamation) or numerous lobbying organizations, are constantly demanding river improvements. Each group presses vigorously for its own dams and reservoirs—for its own regional benefits. The Boulder project, for instance, serves principally the landowners in the Imperial Valley and the people of the Los Angeles area. Bonneville Dam provides low-priced electricity for industries of the Pacific Northwest; Grand Coulee Dam is another source of cheap electricity in the Northwest as well as irriga-

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national income expansion. But Hansen does not say that the full employment should be maintained at any cost. He is not an inflationist or simply a big-debt man. Under some conditions he recognizes the social burden of additional indebtedness.[11]

tion of the Columbia Basin; the services of TVA, too, are primarily regional rather than national in scope; and Big Thompson, Central Valley, Little TVA, and other undertakings confine their services to single states.

Control and utilization of American rivers was not demanded by the whole populace. Only a small fraction of the voters knew about such improvements as the TVA, Grand Coulee, or the Central Valley project when they were being planned. River-basin improvements are sponsored mainly by the farming, business, and civic groups within each watershed area—by the people who anticipate direct benefits. Persons who own irrigable or frequently flooded land, customers of private electric firms, business firms that want low-priced electricity or water transportation, and local governments which always hope for population and industrial growth—these are the groups that urge the water-use improvements in each drainage basin. These groups are not restrained by the full investment costs of improvements; costs are not significant as long as they can be shifted away from the region. Local and regional groups do not draw plans for self-liquidating improvements, or study the best national uses of federal funds. Nor do they seek the dams primarily because they want public electric service; indeed, they usually are strong defenders of private business in other situations, and commonly look on public electricity production as a political by-product of more important purposes. If a national policy for water uses is formulated, Congress and other federal authorities must formulate it. To develop a national plan, Congress must temper the demands of many regions, and balance the probable project benefits against each other. It must relate the benefits and costs of proposed projects.

An Enduring Commitment. Regional interests naturally do not say that the water-basin improvements are expected to be maintained as long as they can be used. These interests work toward getting the federal investments, and do not hurt their cases by talking about the permanency of the undertakings—the lasting responsibilities of the federal government. Yet after a project is completed and the region begins to rely on the improvement, Congress cannot readily abandon the project or let it fall into disrepair. Flood-control and irrigation improvements are taken for granted by their beneficiaries. When people and cities are adjusted to these benefits, they treat the services as possessions. After the federal government turns arid land into fertile and green fields, families and communities are dependent on the continuance of the projects. After dams reduce the flood damage in a river basin, the federal government must maintain the dams or be blamed for renewed floods. Perhaps the continuation of transportation benefits is not so necessary as the continuation of flood-control and irrigation services. Yet many river improvements, built as early as 1850, are maintained constantly, even though nothing but a small amount of low-grade traffic (sometimes only sand and gravel) is transported on them today. The federal government can sell electric plants to private companies and escape the responsibility for future electric service. This is unlikely. Even though dams silt up and turbines or other equipment wear out, buyers of electricity expect reinvestments in the projects and the continuation of public electric service.

Even if the permanence of water-basin improvements seems to be an obvious fact, it does not appear to affect the public investments. Congressmen and public administrators do not talk about the lasting political character of these improvements. Guided more by political exigencies than by objective studies of public investments, they do not recognize how difficult a contraction or an abandonment of public service can be; they do not take a very long economic view of drainage-basin investments. Such a long view of investments is contrary, of course, to any public works policy that is designed to provide employment of men, and to compensate for deficient private investments. This long view in public investment decisions is at odds, too, with the dynamic perspective of project sponsors. Congressmen and regional groups of farmers and businessmen want river improvements for themselves; they are not concerned about the next generation. Similarly, this view is contrary to the experimental nature of some multiple-purpose undertakings. Before 1933 the federal government had no experience with large, integrated watershed improvements; some of the planning necessarily was experimental. Dam building is a popular, booming, experimental political activity now; another generation of lawmakers and administrators must fret over the maintenance and replacement of the improvements.

THE LIMITS FIXED BY THE NONELECTRIC PURPOSES

Controlling the investments in water-basin improvements, Congress takes account of the public benefits from the several services. But the benefits and costs of additional electricity production are not examined alone. The benefits from all services affect the production limit of any separate service. Let us suppose that a project is planned for flood control, irrigation, and electricity production. If electricity is treated as a byproduct of the other purposes, the public investment in flood control and irrigation improvements fixes an absolute limit for the electric generating capacity. Investments in separable electric equipment cannot be extended beyond the given capacity, unless a larger investment is made in dams for the flood-control and irrigation purposes. But electricity production often is a joint purpose of regional projects. When it is, the expansion of electric generating capacity is a function of the expected benefits, pecuniary and social, from all the purposes. As they plan and approve investments in public projects, congressmen and public administrators do not use a formula to fix the limits of the investments. Apparently public authorities look at the aggregate benefits of an improvement, and make a general judgment of the right public investment.

Benefits of Flood Control. There are several kinds of benefits from flood control.[12] Flood-control benefits for property owners, which can be translated into dollar values, usually are emphasized. When farmers and the owners of farm land are protected against floods, their losses of crops, livestock, and equipment are reduced. Similarly, the periodic losses of urban property are reduced or eliminated altogether. Property owners benefit in another way from flood control. After flood controls are effected, farmers can turn their bottom lands to more productive uses; grazing land, for instance, can be shifted to grain cultivation. Likewise, urban land sites can be converted to more productive uses after the flood danger abates. Human lives are saved by flood-control projects. And general public benefits include fewer disruptions of general business activities, transportation, and mail service during the flood seasons.

The value of some flood-control benefits cannot be measured easily. Dollar values cannot be fixed for human lives, and the value of such general benefits as the interruptions of business and transportation service cannot be readily measured. Consequently the dollar value of flood-control improvements usually is determined by property-owner benefits. Annual property damages prior to flood control are computed from available reports. And annual property damages are estimated for the years after the dams or channel improvements are completed. The differences between the two amounts of average annual damages—before and after flood control—measure the annual benefits of dams or levees. This is a rough measure of flood-control benefits.[13] Past reports of flood damages often are incomplete and inaccurate; and some of the old damage reports are inapplicable to present conditions, because industrial growth, building construction, and more intensive land utilization increase the property values that are vulnerable to floods. Yet, in spite of their imperfections, the available reports of flood damages are better than no reports at all.

Computing damages before and after the flood-control improvements are effected, engineers measure the annual benefits of a flood-control project. But this sum does not determine the total commercial value of the project. To determine the present value of flood control, public authorities must capitalize the average annual benefits; they must discount the benefits for each future year of flood-control service. If the anticipated benefits are translated into a current value, a discount rate must be chosen. The choice of a discount rate obviously influences the hypothetical valuation of a flood-control project. A low discount rate gives a higher total valuation than a high rate. In most cases the interest rate on government bonds is used. Thus, if prevention of flood damages is the sole consideration of project investments, the federal government can afford more and larger projects at an interest rate of 2 or 2½ per cent than at higher interest rates.

Flood-control benefits for property owners can be measured in another way. Increases in property values are measured directly. Before the construction of a flood-control project starts, the values of protected and unprotected property are computed. The market value is determined for farm land that is unprotected from flood waters; then the market value for similar but protected farm land is ascertained. And the difference between the two values measures roughly the worth of flood-control improvements to farm landowners. A similar measure of flood-control value can be made for urban property. Further sums are added for the losses of livestock, farm equipment, and household furnishings. Yet this measure, like the measure based on reported flood damages, provides a crude estimate of the total value of flood-control projects. Information on the market value of protected and unprotected property never is complete. And property in flood areas, particularly urban property, commonly is not comparable with protected property.

A Flexible Value. When the financing of flood-control projects passed from property owners or local governments to the federal government, the valuation of flood-control benefits began to change. It became more flexible and less objective. When levees, straightened channels, and small dams were built, the costs of the projects frequently were assessed against property owners. A self-liquidating project did not cost more than the capitalized benefits of property owners. Now when the federal government does the investing and does not assess charges for flood control, the promoters of projects do more than record the flood damages of property owners. They emphasize the human costs of floods—the fear, the suffering of refugees, the ruined homes, the destitution of families, the dead.[14] Put in the hands of some politicians, these human effects of floods are elastic and probably can be stretched far enough to justify any sponsored project. Lacking evidence of large rural and urban property damages, regional groups and their politicians always can imagine enough human anguish to build up a good emotional case for a flood-control improvement.

The flexibility of flood-control values has an important bearing on public power production. More hydroelectric plants can be planned and constructed in the name of flood-control projects. At least the flood-control purpose can be emphasized; the Missouri Valley project, for example, is being promoted as a flood-control venture, though no one needs great vision to see that a large public power program is certain to develop after the dams are built. Flood control affords an easy way to expand the federal power program. If the electric service of a proposed watershed undertaking is expressed forthrightly, some interests try to stop the federal appropriation. At least the private electric companies and their security holders put up a fight. But no group in a river basin objects to flood-control improvements as long as the federal government provides the funds. Even if many families do not own much property or live on high ground, they like the relief from flood dangers, enjoy access to a large artificial lake, and get more income as a result of government expenditures. Perhaps the expansion of the federal power program depends more on flood-control plans than any other factor. Floods occur regularly in nearly every state; every region has hopes or plans for flood control; the people of every water basin can build up emotional and human cases for flood-control investments.

Irrigation Benefits. The economic value of irrigation improvements is based primarily on increases in farm income or in farm land prices.* These increases determine what part of the irrigation costs can be collected from landowners, and what part is the uncollectible outlay of the federal government. Owners of farm land obviously cannot afford to pay more for irrigation improvements than the prospective increments in their land prices. Estimating the effects of irrigation water on land prices, public authorities can compare the prices of irrigated and unirrigated land. Undeveloped land prices should not reflect anticipated irrigation benefits, and should be based on land sales before the project is planned. Irrigated land prices, on the other hand, can be obtained from fully developed projects that have about the same soil composition and approximately the same market location as the new development. When this difference between land prices per acre is multiplied by the total acres in the proposed project, the authorities have an approximate value of irrigation improvements.

A valuation of irrigation improvements can be based, too, on anticipated increases in farm income. If public authorities use the income measure, they must determine the kinds and amounts of crops that can be raised on the irrigated land. Knowing the basic importance of adaptable crops and soil productivity, they examine the probable changes in the intensity of farming that can be attributed to irrigation service.[16] When irrigation farming already is practiced and the new project provides additional water, farmers usually continue to raise the same crops. Boulder Dam provides more water for Imperial Valley farms, but does not alter the basic pattern of land use. And the Central Valley project in California, which brings water from the Sacramento River to the San Joaquin Valley, allows an expansion of irrigation farming, though vineyards and fruit farms still are predominant. But when irrigation water is brought to farmers for the first time, new kinds of crops naturally are produced. The pattern of land utilization cannot be predicted exactly for such a large, new area as the Columbia Basin. Yet agricultural experts studied Columbia Basin soil and prospective markets, looked at land uses in similar irrigation projects, and predicted the distribution of crops (principally hay and grains [17]) in the basin.[18]

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* While more farm income and higher land prices are direct irrigation benefits for landowners, other groups receive indirect benefits. If the demand for farm produce is increasing, the whole nation can benefit from irrigation improvements. Expansion of irrigation farming, rather than higher farm prices, provides the food with which the additional demand can be satisfied. And increases in urban property values, tax revenue, and general business activity are local benefits of irrigation projects.[15]

After the land-use pattern is measured, the future crop yields must be forecast. And the crop prices, too, must be estimated. Finally, after farming costs are deducted, net farm income is estimated before and after irrigation service. Then the difference between the two net income estimates is capitalized at the prevailing interest rates on public loans; this is the present value of irrigation improvements. This present, capitalized value fixes the probable limit of self-liquidating investments. These income measurements commonly are no better than intelligent guesses. Not only is the crop pattern uncertain, but also the estimated and actual crop yields, crop prices, and farming costs may be quite different. Yet an imperfect valuation of irrigation improvements is worth something to congressmen and reclamation officials who are interested in economical public investments and public allocations of resources.

Repayment of Irrigation Costs. When Congress accepted some of Theodore Roosevelt's reclamation program and began to invest in irrigation projects before the First World War, it assessed the investment costs to the landowners. Congress wanted self-liquidating projects; the additional incomes of irrigation farmers were expected to amortize the public investments. But irrigation farming was not always so prosperous as it was expected to be, and Congress was forced to lengthen the repayment period of the water users' contracts. The length of the repayment contracts was increased from ten to twenty years in 1914, and was extended to forty years in 1926.[19] And in 1939, after the payments of water users were reduced during the depression, another concession was granted: the Department of the Interior was authorized to adjust contract payments to variations in farm incomes.[20] Not only the passage of more liberal repayment laws, but also the amortization record showed the slow liquidation of some irrigation investments.[21] Out of twenty-seven irrigation projects, which were constructed before 1919, five were abandoned; others had such poor repayment records before 1938 that, unless the payments increased in the future, nine of the projects could not amortize the original investments in less than 125 years and six more could not pay out before 75 to 125 years.[22] When government projects were built during the early irrigation boom, investment and maintenance costs sometimes were underestimated and land productivity was exaggerated.[23]

When the Department of the Interior planned and built the Kendrick improvement in Wyoming, Big Thompson in Colorado, Central Valley, Columbia Basin, and other projects during the thirties, it knew the amortization record of the earlier undertakings. Yet the new projects often were larger and more expensive than the old reclamation improvements. In 1933 another boom period, indeed, started in irrigation farming. The multiple-purpose character of water-basin projects changed the investment plans for irrigation improvements, and sometimes reduced the investment that was to be paid by irrigation farmers. Part or all the dam and reservoir investment could be shifted to some other purpose such as electricity production. Boulder Dam, which was planned primarily as an irrigation improvement for the Imperial Valley farmers, was an example of cost shifting. The landowners of the Imperial Valley were assessed only the cost of the All-American Canal; water and electricity buyers in the Los Angeles area were charged most of the investment costs. Other improvements had strong political support, and were large outlets for public works investments. Owners of irrigable land wanted some public works money; the Department of the Interior, seeking to hold up its end of the public works program, tried to obtain the improvements for them. Even if the amortization of some irrigation investments was expected, Congress and reclamation officials were less interested in self-liquidating projects than they were before 1930.

The new standards for irrigation investments can be seen vaguely in several projects. One of them is the Columbia Basin project, the country's largest irrigation undertaking. When the irrigation of the Columbia Basin was discussed and planned, the promoters of the improvement talked as though the increases in land values would pay for the Grand Coulee Dam as well as the separate irrigation works. This outlook was far too hopeful. Land sales are not expected to bring in enough revenue to liquidate the investment in Grand Coulee Dam. They are not even expected to liquidate the separate investment in irrigation works that is estimated at nearly $300,000,000 or about $275 per acre.[24] The

Bureau of Reclamation sensibly plans to sell land at reasonable prices regardless of the investment costs. Wishing to sell land at repayable prices and planning to differentiate between different grades of land, the Bureau believes that it can sell an average acre for no more than $85.[25] At this rate the land improvements, for which the Grand Coulee enterprise was planned originally, will repay less than $100,000,000 out of nearly a $500,000,000 investment.* If the undertaking is self-liquidating, the rest of the investment will be repaid mainly out of electricity sales (the Bonneville rates are proposed [27]), and partly out of water-pumping charges to irrigation farmers.[28] Meanwhile, a long time probably will pass before the electric plant will be fully used—before the electric revenue, estimated generously now, will be high enough to pay off any part of the irrigation cost as well as the electric investments.

The Columbia Basin improvement has values, to be sure, other than land values: more crops, outlets for competent farmers, and better living for a large number of people. Social values can make up some deficiencies in the dollar values. Given broad powers by Congress,[29] the Department of the Interior can fix the maximum size of basin farms, appraise the value of all land,[30] acquire all undeveloped land (except the maximum-size farms that the present landowners are allowed to keep), select the new farmers for the area, and fix the prices of water rights.† If the Department of the Interior plans intelligently and is not forced to make many political compromises, it can increase the social value of the Columbia Basin project. Yet Congress and the Interior Department cannot justify any irrigation improvement that any group of Western farmers may want. Acting intelligently, they cannot lose sight of the fact that taxpayers pay the revenue deficiencies of land reclamation—that the cost of irrigation undertakings may become a questionable burden for urban people.

A Further Expansion of Public Electricity. The present political boom in land reclamation, controlled partly by indefinite social benefits, increases the output of public electricity. Land reclamation is an important factor in the public power program. Like the flood-control program of the federal government, irrigation of dry Western lands provides dams that can produce much electricity. The Interior Department is involved almost as much in electricity production as in land reclamation; it is, indeed, a leading Washington center of public power protagonists. As the standard of self-liquidating investment is relaxed for irrigation undertakings and as the measurement of irrigation benefits becomes more flexible, more projects, producing both irrigation and electric services, can be anticipated. And political promotion of more public electricity can be kept in the background; the primary product, irrigation of land, can be in the political foreground where it is supported commonly by the Western congressmen. Reclamation investments seem to afford an easy, even a covert way to expand the public power program.

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* Using the TVA method of joint investment allocation (the "alternative justifiable expenditure" method that is described in the next chapter), the Interior Department computed a $342,000,000 investment for the irrigation purpose.[26] While the Secretary of the Interior accepted this figure of the total irrigation investment, he knew that land users could not afford to repay such a large sum.

† When the original Columbia Basin Act was passed, a maximum farm of 80 acres for a man and his wife was prescribed. Taking account of variations in crops and probable farm incomes, Congress fixed new limits of farm sizes in 1942 of 10 to 160 acres, and the Department of the Interior was authorized to choose the exact size of each farm.[31] To prevent speculation, Congress circumscribed the resale prices of land; it forbade land sales at more than appraised values within five years after water was available.

Navigation Benefits. Regional groups of farmers and businessmen, politicians, and ambitious public administrators often foresee large benefits from inland waterway improvements. A former TVA director, David Lilienthal, anticipates heavy barge traffic on the Tennessee River, and expects the economies of water traffic to justify a sizable part of the total TVA investment.[32] If the prices of waterway transportation service are lower than rail and motor transportation rates, a river navigation improvement obviously is beneficial to shippers. Differences in rail and water freight rates are computed for the commodities that can be transported on the river. Next, the waterway traffic for each commodity is estimated for each future year of waterway service, and is multiplied by the difference in barge and rail rates. This sum is the aggregate saving for waterway shippers. To measure the present value of these benefits, public authorities must discount the estimated savings of each future year.

Waterway sponsors and administrators frequently exaggerate the usefulness of waterway service. Even though low-grade commodities such as sand and gravel are transported on both improved and unimproved rivers, they are counted among the goods on which economies can be realized. Large amounts of future traffic are foreseen. The anxious sponsors usually foresee too much traffic. Or they exaggerate the rate of traffic expansion; they foresee a traffic growth in ten years that is more likely to be realized in a quarter century. Even the Mississippi Valley system of waterways, the nation's largest and most promising river improvements of which the Tennessee waterway is only a branch, does not yet fulfill the traffic expectations of its sponsors. Waterway traffic and savings in freight rates, moreover, do not measure the net dollar value of a waterway improvement. The depreciation, interest, maintenance and management costs, which sometimes are called the "hidden" costs of water transportation, must be counted; the discounted value of these costs must be deducted from the discounted value of the shipper savings before the net money value of a waterway is measured. Just as the traffic and shipper savings can be overestimated, so these costs can be underestimated.

The case for public investments in inland waterways should not be based altogether on transportation benefits for individual shippers. Some consideration should be given to the public need for transportation facilities. If railroads have much unused plant capacity most of the time, economic resources are wasted when waterways are built. Next, barge service often is an inferior transportation service. Waterway traffic usually is confined to low-grade commodities, moves slowly, and stops during the winter months in Northern states. Sponsors of waterways often say that new industrial plants can develop along waterways. Yet these industrial developments may represent a shift of industry to low-priced transportation rather than the creation of additional industrial plants and more jobs. When river cities draw industrial firms away from inland cities, the nation does not show a net gain in business activity. The economies of water transportation, furthermore, are not always translated into lower commodity prices. When the shipper sells his product under oligopolistic or imperfectly competitive conditions, he is likely to keep a moderate saving in transportation costs. River barges sometimes are owned by steel, oil, and other manufacturing companies. These beneficiaries of waterway improvements apparently do not reduce their prices where their barges operate, and give all or part of the transportation economies to consumers.

A river navigation project, like flood-control and irrigation ventures, is more easily promoted than a public electric plant. This is true, even if the federal government does not charge waterway tolls.* Although the federal government invested about $125,000,000 in the Fort Peck Dam in Montana, the expenditure did not attract much public attention. Yet, if the government had spent half as much money on an electric system in Montana, the project would have been widely known. Bonneville Dam originally was sponsored as a waterway improvement rather than a power plant; the sponsors knew that a waterway attracted less opposition than a public electric plant. And the navigation purpose can be emphasized in some future improvements, even though electric service is the main purpose. The St. Lawrence project, for example, is more likely to be approved for navigation service than for public electric service in New York state. This is another way to increase federal power production without planning directly for it.

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* A social standard of pricing allows toll-free service on bridges, highways, and waterways. If waterway service rather than waterway revenue is the main consideration, tolls should not be charged until the waterways are congested with traffic. Tolls should be used to ration the use of waterways. But Congress apparently has a simpler explanation of toll-free service: it is traditional in American politics.

INVESTMENTS IN ELECTRIC SERVICE

Further expansion of the joint-purpose projects is dependent, in part, on the prospective markets for electricity. The good markets are occupied now by private electric companies. Blocked out of these markets, some federal power systems try to develop their own markets among industrial consumers, rural cooperatives, and municipal plants. A few projects, such as the TVA and the Nebraska system, buy private electric plants and promote larger industrial, rural, and domestic consumption of electricity. A continuous, economical expansion of the public electric program presupposes, indeed, the acquisition of private companies; either a growing public production finds outlets in large population and industrial centers, is consumed at very low prices in cheap manufacturing uses, or is wasted.

Acquiring a Market. Even before the construction of Boulder Dam was started, the Department of the Interior had a market for Boulder Dam electricity. Fifty-year contracts were negotiated with private and municipal electric systems in southern California, and with the Metropolitan Water District of Southern California.[33] Although the TVA commenced to sell electricity in an area that was served by private companies, it acquired and rapidly developed a large market. It bought private electric systems, concentrated on the production and transmission of electricity to municipal and cooperative distribution systems, and introduced notable low wholesale and retail rates. Beginning with three hydroplants and a meager market, the Nebraska electric system acquired nearly all the private electric plants in the state, and quickly expanded into a large-scale, promising system. Even the Bonneville plant, which began to operate under unpromising conditions, obtained a large industrial market for its electricity during the Second World War. Although part of the Bonneville industrial market was lost as soon as war production was cut back, the political and commercial interests of the Pacific Northwest did not stop planning for a large industrial expansion.

Administrators of other public projects still are struggling, however, to find markets for their electricity. Many dams are located in sparsely settled sections of the country. They are far from large cities; yet they often have a large potential capacity for power production. The Fort Peck Dam, for instance, has a poor location for the sale of electricity.*

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* The Department of the Interior hopes to sell Fort Peck electricity in Montana and North Dakota at wholesale rates that are lower than the standard wholesale rates for TVA electricity.

Located in east central Montana, it is beyond a feasible transmission distance to any city that has as many as 100,000 inhabitants. Smelters and mines around Butte, which are three hundred miles from Fort Peck, need more power sources in dry years.[34] Private power companies are willing to buy some electricity from Fort Peck, but new public markets are not available as they are in Tennessee. Likewise, the Seminoe Dam of the Kendrick reclamation project in eastern Wyoming can produce a sizable amount of electricity—but it is located in a thinly populated area where large industries and a noteworthy public-ownership movement do not exist. Unless the Big Thompson electricity is sold to private companies, the Interior Department may be hard pressed to find a market for it. The Pacific Gas & Electric Company holds the only large markets in which the electricity output of Shasta Dam can be readily sold.[35] And no large market clearly awaits the power output of Grand Coulee Dam other than the new Columbia Basin.

If the administrators of Grand Coulee, Big Thompson, Central Valley, and many lesser projects do not find attractive markets for electricity and are compelled to sell their output to private companies, the federal power program cannot be fully developed. Congress always has requests for far more public improvements than it ever can finance. When multiple-purpose undertakings produce electricity that is not easily sold or that must be sold at "dump" prices, Congress can lose interest in power projects. Another limitation is the location of undeveloped water-power resources: the majority of the good, undeveloped hydroelectric sites are located in the Rocky Mountain and Pacific Coast areas.[36] These possible sites for future projects are far from the present concentrations of population and industry. Before these water resources can be economically developed, technical economies of long-distance transmission of electricity must be discovered or the Western markets for electricity must expand enormously. Other proposed projects have better locations. One of these is the St. Lawrence Seaway. This proposed improvement is near large centers of population and industry where continuing increases in electricity demand are expected in future years.[37] Yet, even if this project is approved by both the American Congress and the Canadian Parliament, it must struggle with the entrenched private companies before it is a success.

Industrial Outlets. Sometimes the public administrators emphasize the development of industrial markets for public electricity. If they need large amounts of electricity, industries can be attracted to the regions that have large hydro-power resources. When they urged the construction of Bonneville Dam, the civic interests of Portland, Oregon, saw an opportunity for an industrial development in their part of the Columbia

River Valley. If they could get a low-priced supply of electricity, they expected large investments in metal and chemical plants that consumed large amounts of electric power. Bonneville Dam provided the low-priced electricity. And the Second World War brought the new industries to the Portland area. Since they experienced some industrial growth after 1940, the people of the Pacific Northwest believed more strongly in the industrial future of the region. They made extensive studies of available raw materials and markets, and began to plan for a diversified industrial expansion that could be based on low electricity prices.[38] If the predicted demand for electricity is realized, the enormous generating capacity of Grand Coulee Dam can be fully utilized and more dams must be built to serve the electricity consumers. Yet some of these industrial anticipations may be hopeful planning rather than rational predictions.*

When public projects are used to attract industrial plants to an area, the federal power program is divested of any national purpose. It serves acquisitive regional interests exclusively. Where the total revenue is less than the total costs (as it is likely to be if the costs are not manipulated and if the regional interests get the prices they want), tax revenue is used to subsidize the shifts and expansion of industry. If the attraction of new industries becomes a common purpose of all undertakings, the administrators must compete with each other for new manufacturing plants. Each administrator must reduce his electricity prices below the prices of other projects. His geologists must search for minerals, and his representatives must solicit industrial companies. Otherwise his region loses some industries, or does not share in the industrial expansion of the country. This kind of public-project competition is not yet evident. At least the TVA does not protest against the industrial expansion policy of the Bonneville project, even though aluminum production in the Tennessee Valley may be less than it otherwise would be. But the civic interests of southern California are watching the effects of the Bonneville electric rates on industrial locations.[41] Boulder electricity is delivered to Los Angeles for about $33 a kilowatt-year whereas Bonneville electricity is sold to public and industrial buyers for $17.50 a kilowatt-year.[42] If the Bonneville power policy is extended as far as the ambitious leaders of the Pacific Northwest apparently want to carry it and if it begins to draw many industrial firms from other areas, the business and political interests of the other regions are certain to make protests.

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* The administrator of the Bonneville project, who is enthusiastic about the industrial prospects of the Pacific Northwest, says, "What we have out here . . . is a colonial empire status. It is a large source of raw materials. But because of a lack of population sufficiently large to develop its own enterprises, the West has been used by the East where the population is larger and the home market is larger." [39] He thinks that low electric rates can produce an important conjunctive growth of population and industry.[40]

Relation to Private Firms. When multiple-purpose projects enter markets that are occupied by private electric companies, the federal authorities cannot ignore completely the inevitable rivalry between the public and private enterprises. Confronting this rivalry, Congress and project administrators have a choice of several public policies.[43] For one choice the government can duplicate the private generating and distributing systems, using competition to force down the private company rates. This purpose of public investments is vigorously supported by the "left-wing" enthusiasts of public ownership, for they want to make public electric prices the bench marks for private company prices. Choosing another policy, the government can develop its own electric system and ignore any possible effects on the private investments. In this case the public price and service policies are not forced on the private companies; at least the private firms are free to follow or to ignore the public system. And when a third choice is made, the public system can buy the private plants and eliminate the private-public conflicts forever. When two systems try to share a market, some duplication of generating, transmission, and distribution plants usually occurs. Thus the public acquisition of private plants can economize the public investment unless exorbitant prices are paid.

When the TVA first began to operate, some politicians and public power partisans had an interest in the first choice. Desiring reductions in private company rates, they spoke of TVA rates and other public rates as "yardsticks" for private company prices. In a campaign speech in 1932 President Roosevelt said,

> . . . the very fact that a community can, by vote of the electorate, create a yardstick of its own, will, in most cases, guarantee good service and low rates to its population. I might call the right of the people to own and operate their own utility something like this: a "birch rod" in the cupboard, to be taken out and used only when the "child" gets beyond the point where mere scolding does no good.[44]

Using the yardstick, President Roosevelt defended the public investments in the TVA and other joint-purpose projects. The yardstick became a handy, freely used term of the new public-ownership movement.

The yardstick idea was consistently supported by the left wing of the public-ownership movement. Forsaking commission regulation of private companies, these partisans wanted to press down electricity prices by building large public plants.[45] They were more interested in the prices of electricity than in the economies of public electric service.* But other persons, including some supporters of public electric service, criticized the yardstick idea.[46] They saw obvious differences in public and private costs that justified differences in public and private prices. The costs of TVA service, for instance, were not the same as private company costs: the government borrowed at low interest rates, the TVA did not pay taxes that were equivalent to all private company taxes, construction materials and other goods were transported at reduced rates over land-grant railroads, and further savings were effected on legal work, automobile licenses, gasoline taxes, and other services. More important, the public and private plants were not alike. Private companies produced electricity with single-purpose steam or hydro plants; the public electric service came from multiple-purpose dams where electricity was only one of several joint products.

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* Threatened with competition from the TVA, the Commonwealth & Southern companies reduced their rates. They introduced "objective" price schedules that are described

The yardstick idea had other faults. To force down private electric prices, the federal government was compelled to duplicate the private plants. Like the idea of burning houses to roast pigs, the costs of plant duplications doubtless were not balanced by the benefits of price reductions. The yardstick concept also gave the private companies a talking point. Since this kind of price regulation was supposed to eliminate excessive private returns, the companies could argue that yardstick rates should be based on minimum private costs of service rather than public costs of electricity. Consequently the yardstick rule threatened to divert administrative attention from public service economies—to neglect some broad social objectives of pricing.

Purchases of Private Plants. Congress and public project administrators did not follow the yardstick idea. Some projects developed their own markets; Bonneville Dam obtained an industrial market, and Grand Coulee electricity had an outlet in the Columbia Basin. Other projects bought private generating and distributing systems. When the TVA failed to get satisfactory pooling and market division agreements with private companies, it began to acquire private plants.[47] All the large private plants in Tennessee and some plants in adjoining states were purchased. Obtaining nearly a half-million customers who formerly bought electricity from private companies, the TVA became an electricity distributor throughout Tennessee, northern Alabama, and northern Mississippi. The cities of Nashville, Memphis, Knoxville, and Chattanooga as well as smaller towns and rural areas were served with TVA electricity. Widespread consumption of service rather than regulation of private companies was the main objective of TVA.

When the TVA acquired private systems, it retained the generating

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in Chap. 25. Accompanying their rate changes with vigorous campaigns for appliance sales, the companies realized increases rather than decreases in total revenue.

plants and transmission equipment and sold the distribution systems to the municipalities or to local cooperative associations of buyers. The largest private company in the Tennessee Valley, the Tennessee Electric Power Company, was purchased in 1939 for $78,600,000.[48] When negotiations for this property began, the TVA offered to pay the original cost less depreciation, which was about $60,000,000. Eventually the TVA and the company agreed on another measure of the purchase price. This was the price measure: the face value of outstanding bonded indebtedness, the face value of outstanding shares of preferred stock, and a "substantial amount of cash" for the common stock that was held chiefly by the Commonwealth & Southern Corporation. This method of price determination was based on equitable payments to security holders, though the TVA officials said that nothing was allowed for going value or good will.*

When the three hydro districts in Nebraska were ready to sell electricity, they did not have access to many retail outlets. Most of the available markets were held by private electric companies. To provide public distribution as well as public generation of electricity, the Consumers Public Power District was organized and began to acquire private electric properties throughout Nebraska. The Consumers District sold revenue bonds in the open market, and invested about $47,000,000 in private plants. A broker handled the acquisitions, and was paid a commission on each purchase.[50] Apparently the purchase prices were determined more by bargaining than by a fixed formula. At any rate the Consumers District acquired nearly all the private companies in Nebraska; the only significant exception is in Omaha where a similar agency, the Omaha Public Power District, acquired the private system and sells electricity.

The TVA and the Consumers District are the big purchasers of private electric systems. Acquiring nearly all the plants around them, they blanket Tennessee and Nebraska with public electric service. In 1939 the Lower Colorado River Authority, a state of Texas agency, purchased a private system; after negotiations broke down and a PWA loan was arranged for the construction of a public distribution system, the Authority bought the private property for $5,000,000.[51] The Bonneville Power Administration encourages public ownership of distribution systems and assists public utility districts as they bargain for private companies, but it does not buy the private properties.[52] Other projects, which are managed largely by the Interior Department, apparently do not plan immediate purchases of private plants. Much of the Boulder electricity already is sold to municipal electric systems; the Big Thompson, Fort Peck, and other projects need large markets for their electricity, but nothing is said now about taking over private companies; and while the public power men of California are anxious to have public outlets for Shasta and other Central Valley electricity, an acquisition of the Pacific Gas & Electric Company is only a hope for the present. A predominance of public electric service still seems to be a long way off in this country.

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* When the city of Memphis bought a private electric plant, it measured the purchase price (according to TVA reports) in the same way.[49]

Chapter 33

Cost of Regional-project Electricity

WHEN THE federal government builds or finances a multiple-purpose project, no charges commonly are made for the flood-control or navigation benefits. These are free to the property owners and business interests of watershed areas. But the federal government does fix prices for irrigation service and electricity, even though the electricity and irrigation improvements are not always self-liquidating. Prices do not fix the limits of flood-control and navigation investments, but they are used to ration irrigation water and power. If irrigation improvements were free, the Bureau of Reclamation would be one of the busiest organizations in the federal government. Similarly, if electricity were free, the demands for service would be far higher than the capacity of the projects. To meet the demands of residential, commercial, and industrial consumers, the federal government would be compelled to invest freely in electric generating plants; perhaps it would be compelled to invest in single-purpose plants—in either steam or hydro plants. Prices, then, can be used to ration an abundant, but not an unlimited output of electricity.

The prices of regional-project electricity usually are based on the costs rather than the demands for electricity. At least the project administrators say that the prices are controlled by costs. Some of these, particularly the current or variable costs of production, are similar to the costs of private companies. These are the costs of labor, material, management, and recurring maintenance or repairs. But other costs of public electricity are unlike the private costs. Public plants do not pay taxes in the same way that private firms do, though some of them make payments, which are called "tax equivalents," to state and local governments. There is a further difference: the regional projects jointly produce electric, flood-control, irrigation, and other services. The costs of electricity depend, therefore, on how the joint plant investments are allocated to the several purposes. These allocations often are controlled by the judgments of the persons who make them. Consequently the "determined" cost of public electricity is a flexible sum; it is large when private companies measure it, and moderate or small when some advocates of public ownership compute it.

PAYMENTS IN LIEU OF TAXES

The managers of private electric companies think that the multiple-purpose projects should pay taxes. Trying to protect their markets and investment values, these persons want the federal government to manage the enterprises as though they are private businesses. This is an obviously biased idea. Since multiple-purpose projects are public ventures, their character is twisted when they are turned into private-type enterprises, just as the nature of private companies is distorted when the private standards of investment and pricing are ignored. Taxes are not necessary costs of public electricity, just as the "yardstick" commonly is not a desirable standard of private electric prices. Actually the public projects do not pay taxes, but some of them make payments to governments.* Electric revenue from Boulder Dam is used, in part, to make payments to the states of Arizona and Nevada, and to finance investigations of future Colorado River developments. And local and state governments in the Tennessee Valley receive payments in lieu of taxes from the TVA. Payments in lieu of taxes are special costs of public electric service.

The Boulder Payments. The water of the Colorado River and its tributaries, which the states of Arizona and Nevada counted among their resources, was utilized by the Boulder project to provide services chiefly for Californians. Water from the Colorado River was used to irrigate the Imperial Valley, and to sustain the expanding populace of southern California. Even most of the Boulder electricity was not consumed in Arizona and Nevada. Each of these states was allotted 18 per cent of the total electricity output, though no one expected so much power to be consumed in these sparsely populated states. Yet, even if they cannot use Colorado River water or Boulder electricity, Arizona and Nevada want compensation for California consumption of their water resources. Life and business in the arid Southwest depend on water. Knowing this, Arizona and Nevada want compensation for the water and electricity that someday can be used at home. They have been given some compensation.[2] Until 1987 each of the states of Arizona and Nevada will receive $300,000 a year from the Boulder electricity revenue.†

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* Federal government payments to state and local governments in lieu of taxes are not confined to electric projects.[1] The Department of the Interior pays 37½ per cent of all royalties and rentals from mineral lands to the states in which the lands are located. State governments receive 37½ per cent of the Federal Power Commission's revenue from private power projects that are located on federal lands. To support schools and to maintain roads, the Department of Agriculture gives 25 per cent of national forest revenue to the counties from which it is obtained. And the real property of the Reconstruction Finance Corporation is subject to both local and state property taxes.

† Before 1940 the Arizona and Nevada payments were computed in a different way.[3] Each state received 18¾ per cent of the electricity revenue in excess of amortization requirements; the remaining 62½ per cent of the excess revenue was used to amortize

There is another "public" cost of Boulder electricity. This is the cost of planning and investigating future river improvements in the upper basin states—the states of Colorado, Wyoming, New Mexico, and Utah. Although Boulder Dam does not provide direct benefits for these states, it utilizes water from them. The water requirements of the Imperial Valley and the Los Angeles area restrict, indeed, the construction of more irrigation projects along the Colorado River. Consequently, until 1987 an annual transfer of $500,000 is required from the Colorado River Dam Fund, the amortization fund of the enterprise, to the Colorado River Development Fund, a special U. S. Treasury fund. This fund can be used to make Colorado Basin studies and investigations, and to formulate a "comprehensive" plan for further irrigation, electric-power, and water-control improvements in the basin.

TVA Tax Payments. When multiple-purpose projects are constructed, state, county, and local governments of a region can lose tax revenue. If the public projects acquire private electric companies, the governments obviously lose the tax revenue from these firms. And governments lose tax revenue, too, when large reservoirs cover taxable land. For some undertakings, such as the TVA, the tax revenue loss is large for the counties in which the reservoirs are located. But other dams, such as Boulder, Grand Coulee and Fort Peck, are located in sparsely populated areas; they do not displace valuable land from which local and state governments once received much tax revenue.

Before 1940 the TVA made voluntary payments to state and local governments in lieu of taxes.[4] Now the TVA is obligated to make payments to the state and local governments.[5] Starting at about 10 per cent of gross revenue in 1940, these payments in lieu of taxes are gradually changed until, in 1949 and thereafter, they are 5 per cent of the gross electric revenue. Half of each payment is divided among the several states in proportion to the TVA revenue that is received in the states during the preceding year; the other half is apportioned according to the electric property that is located in the states. There is a minimum annual apportionment for each state: it is the average amount of property taxes that the private electric companies paid during the two years before the TVA acquired their properties.* County governments receive minimum

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the $25,000,000 statutory allocation to flood control. When the Boulder Canyon Act was revised in 1940, not only were the Nevada and Arizona payments changed, but also the amortization of the flood-control investment was deferred until 1987.

* Although the Consumers Public Power District, the public distribution system in Nebraska, is exempt from taxation, it is required to make payments in lieu of taxes. Like the minimum TVA payments, the Nebraska payments are measured by the taxes that were paid during the year before private property was acquired by the Consumers District. These payments include the private franchise and occupation taxes as well as property taxes. Thus the state and local governments in Nebraska do not lose tax revenue; nor do they gain tax revenue when the public electric service expands,

payments out of the state apportionments. One part of the county minimum is measured, like the minimum state apportionments, by the average (two-year) taxes on property that the TVA acquires. The other part, the most important part for the counties in which dams are located, is 40 per cent of the average annual taxes that were paid during the two years before the TVA acquired reservoir land.*

The TVA payments in lieu of taxes are generous. State, county, and city governments generally do not lose much revenue as a consequence of TVA operations; sometimes their revenue increases as the TVA expands. Protecting the state and local governments against impairments of their finances and revisions of their taxes, the TVA avoids conflicts with local interests. Payments in lieu of taxes are premised, in fact, on the continuation of existing political functions and taxation patterns. They are not controlled by what the tax revenue of state and local governments should be. The TVA takes the governments, even the small counties in the mountain country, as they are, and makes the payments. Political opportunism explains the "taxes" of TVA.

Congress and the TVA make no clear distinction between taxation of private companies and of public enterprises. The private tax bills simply are transferred to the public project. Perhaps the private electric companies were taxed heavily because their earnings were excessive, because state regulation was ineffective. Yet, even if the project reduces electric prices and does not seek excessive returns, it pays "taxes" that are based on excessive private earnings. Consumers of public electric service do not wholly escape the effects of inefficient regulation. And measurement of these payments makes no allowance for the local and regional services of the TVA. The Authority provides benefits for which the federal government makes no assessment against state, county, and municipal governments. Large public expenditures increase the employment of labor and other resources. Flood control, land improvements, low-priced electricity, recreational centers, river navigation—all these benefits improve the welfare of the region, states, and localities. The project also produces increases in tax revenue when it increases the income, industry, and property values in the water basin. Because large public expenditures on construction work increase the income of the area, the state governments obtain more revenue from income and sales taxes. Later, flood-control and irrigation improvements increase the taxable value of land and property; and an expansion of industry, induced by low rates for electricity, produces other increases in tax revenue. Perhaps these additions to tax revenue are as large as the tax revenue losses from private property sales, though the counties with reservoirs doubtless are short of tax revenue. Yet Congress and project administrators see only the immediate tax effects of public undertakings, not the total tax effects.

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* This part of the minimum payment is restricted to 40 per cent of the annual average because 40 per cent of a reservoir investment is allocated to the power purpose.

INVESTMENT COSTS AND THEIR ALLOCATION

Electricity revenue is expected to repay some part of the public investment in multiple-purpose projects. The revenue is supposed to be higher than the current, short-period expenditures. Some fixed costs of service, which are connected with the heavy investments in dams and transmission equipment, as well as the immediate labor, raw material and tax costs commonly are counted among the costs of public electric service. The total cost of electric service depends on whether electricity is the main product, a by-product, or a joint product of the dam and reservoir. If electricity is the main product or by-product, the total cost can be measured easily. But when electricity and other services are produced jointly, the measurements are difficult and are controlled more by administrative judgments than by objective reasoning.

Electricity, the Main Product. Electricity can be the main product, by-product, or joint product of a regional project. If it is the main product, the whole investment in dams and reservoirs as well as generating plants and transmission lines is allocated to power operations. This is a proper accounting for production costs, even though the enterprise also provides other services such as river navigation, flood control, or irrigation. The dams and reservoirs are used primarily to produce electricity; production of flood control or other services is incidental to the power service. When electricity is the main product, the investment allocation is simple: no part of the dam and reservoir investment is allocated to the other services. And only the separable investment costs are assigned to the incidental services.

Electricity seems to be the main product of some projects. The Loup River District, one of the hydro districts in Nebraska, is devoted altogether to electricity production. The other districts in Nebraska, the Central Nebraska and Platte Valley Districts, are primarily producers of electricity. Even though these two districts produce both irrigation and electric services, the revenue from irrigation service is less than 10 per cent of the total revenue. And the Santee-Cooper project in South Carolina provides so little transportation service that it can be considered a power project. Even though the Santee project is designed to provide transportation channels on two tidewater rivers, the transportation service is insignificant in comparison with electric service. Similarly, electricity is reasonably classed as the main product of the Bonneville project, because river transportation above the dam is unimportant.

Electricity, a By-Product. The production of electricity sometimes is incidental to other public services. The dam and reservoir are built primarily to provide flood-control, irrigation, or navigation service instead of electricity. A number of projects are planned and politically sponsored for other purposes than the production of electricity. The Fort Peck Dam was planned definitely as a navigation improvement of the Missouri River.* Likewise, the Grand Coulee Dam was designed to irrigate the Columbia Basin; power production was always a secondary consideration, though the Interior Department now is ready to turn the relationship around and pay the irrigation investments with the electric revenue.[6] The Big Thompson, Kendrick, and Central Valley improvements also were planned chiefly for irrigation services. Many other dams, such as those in Texas and Arkansas, produce large quantities of electricity, though their main purpose obviously is flood control. And as dams are built on the Sacramento River and its tributaries, the lower Missouri River, and numerous other rivers, the primary objective is flood control; at the same time a large amount of electricity can be produced.

When electric service is a by-product of other services, it need not be assigned any joint costs of production. None of the investment in the dam and reservoir should be allocated to the electricity purpose. Consequently the average investment for a unit of service capacity is likely to be low; and there is a good chance, even for a poorly located undertaking, to repay the "electric" investment. But electric service is not a by-product of the whole multiple-purpose project. All the power station, transmission lines, and distribution equipment usually are assigned to the electricity purpose. There are some exceptions, however. When the power plant and transmission lines are used for more than ordinary electric service, the whole investment in them is not chargeable to electric operations. This is the case for irrigation projects. Some of the power plant and transmission lines are used to pump water for irrigation farmers. Even if electricity is a by-product of the dam and reservoir, it still can be a joint product of some other parts of the plant.

Joint Investment Costs. Electricity also can be a joint product of dam and reservoir investments. Joint production of electricity and one or more other services is a common characteristic, in fact, of water-basin improvements. The TVA is an example of the joint service production.

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* When the Federal Power Commission allocated the investment costs of Fort Peck Dam, all the dam and reservoir investments were assigned to navigation service. Only the separable costs, such as the costs of the power plant and transmission lines, were allocated to electric operations. This was a reasonable allocation, because electricity production clearly was a by-product of the project.

Investments in TVA dams, reservoirs, and other water-flow improvements provide electricity, flood control, and navigation services. Producing several services jointly, the TVA must compromise the advantages of high and low dams. Low dams are necessary for navigation, but they do not control floods and they are less effective than high dams for power production. To meet the statutory requirement of a nine-foot navigation channel from the Ohio River to Knoxville, the TVA engineers constructed low-head dams along the Tennessee River. And on the tributary streams they built high storage dams. Jointness of production is evident, too, in the use of the dams. When electricity alone is desired, the reservoirs are emptied gradually during the dry season; they are emptied more quickly for flood control. A full reservoir provides no storage capacity for flood water, just as an empty reservoir provides no electricity. A middle course between flood control and power production is a necessary condition of the joint operation of a storage dam.

Joint production of electricity and one or more other services is chosen because it is the most economical way to produce the services. Producing two or more services with a single plant, an enterprise invests less money than in separate, single-purpose plants for each service. The economies of joint investment can be used to reduce public electric rates below private electric prices. But these economies of joint production are not limitless. Separated from technical problems of joint plant operation, the limits of joint investment are functions of the single-purpose benefits. If a need for flood control or electricity cannot be shown, the federal government obviously cannot realize any joint-production economies. Joint production of these two services is uneconomical, too, when river channel improvements are a far cheaper means of flood control than the construction of expensive storage dams. Likewise, when the separate investments in irrigation improvements are high relative to the selling prices of the improved lands, electricity probably can be produced more economically in single-purpose plants. And river navigation, which commonly seems to be a low-grade location for public investments, does not offer many opportunities for significant economies of joint production.

Boulder Allocations. The joint investment allocations for the Boulder project were fixed by Congress in the Boulder Canyon Project Act. A sum of $25,000,000 was allocated to flood control, and only the investment in the All-American Canal (about $35,000,000) was allocated to the irrigation purpose.[7] The remaining investment, which included about three-quarters of the dam and reservoir investment, was earmarked for amortization out of the electricity and water revenues. When the original fifty-year contracts were drawn up, the prices of Boulder electricity were based on the alternative costs of electricity production in southern California—on the prices of fuel oil and natural gas that were used in California generating plants.[8] A fuel oil price of 75 cents a barrel was forecast for the first fifteen years of the contracts, and was used to determine the electricity prices. In addition the Metropolitan Water District of Southern California agreed to pay 25 cents an acre-foot for water-storage service.[9] This price, fixed by negotiations between Department of the Interior officials and the Metropolitan Water District, was based essentially on what the district could afford to pay.

The joint costs of Boulder project services did not determine the prices of Boulder electricity or water service. These prices were based instead on the demands for electricity and water service. The financial plan of the enterprise was designed to maximize the revenue from electricity and water service; these vendible services afforded the only available ways in which the public investment could be repaid. If the demand for Boulder electricity and water service had been higher, a larger part of the investment could have been amortized out of the revenue; less than $25,000,000 could have been allocated to the flood-control purpose. At any rate, the allocation of $25,000,000 to flood control seemed to be the amount of total investment that could not be repaid out of electric and water revenue. The consumers of electric and water service in the Los Angeles area were exploited to liquidate a public investment. Seeing a different pricing policy among the later undertakings, the civic interests of the Los Angeles area objected to the high Boulder earnings under the original contracts.[10] They were given some relief in 1940. The 4 per cent rate of interest, which was higher than interest rates on government bonds, was lowered to 3 per cent and the electric rates were reduced.[11]

The Bonneville Allocations. Another questionable allocation of joint investment costs was made for the Bonneville Dam. A simple allocation of the Bonneville investments was available. Since electricity production really was the primary service and river navigation obviously was a minor service, all the dam and reservoir investments (exclusive of those in navigation locks and channel improvements) were allocable to electric operations. Political and industrial leaders of the Pacific Northwest, the Bonneville Administrator, the Federal Power Commission, and Congress really knew that electric service was the main reason for the project. Yet the Federal Power Commission, which was authorized to make the Bonneville allocation, turned the purposes around and made navigation more important than power production. When a preliminary allocation of the joint investments was made in 1938, the Power Commission assigned only 32.5 per cent to electric service and 67.5 to navigation.[12] After the sales of Bonneville power increased greatly during the war, the commission made another allocation in 1945.[13] This time a fifty-fifty division of the joint investments was made between power production and navigation service. The chief engineer of the Power Commission, who computed the fifty-fifty allocation, made navigation the primary purpose because the project originally was authorized for "navigation on the Columbia River, and for other purposes incidental thereto."[14] Then he examined the possible future revenue from Bonneville electricity and allocated as much investment to electric operations as the project seemed able to amortize in fifty years.[15]

The Bonneville allocation was poorly reasoned. First, electric service was considered incidental to navigation service, but half of the joint investment was allocated to it. If the power production really was a by-product of river navigation, then all the joint investments were allocable to navigation. Next, when the Power Commission measured how much investment could be amortized with electric revenue, it turned the cost-price relationship around. The established prices were used to measure the cost allocation to electric operations; the cost allocation was adjusted to prospective revenue at the existing prices and was not used to control the prices.* Third, the Power Commission did not study both the Bonneville and Grand Coulee plants, even though the Bonneville prices also were used for some Grand Coulee sales. Simplifying the problem and allocating only the Bonneville costs, the commission ignored the eventual integration and uniform electricity prices of Columbia Basin improvements. Finally, the commission did not go behind the statute, recognizing the superiority of electricity production and the inferiority of navigation service. Since only a few small-sized cities were located above the dam, Congress surely did not have high anticipations of water transportation benefits. The statutory emphasis on navigation apparently was chosen so that the political conflicts about public power production could be minimized. Following the letter of the law and accepting the political inversion of purposes, the Power Commission made a kind of cost allocation that can hurt the public ownership movement.

TVA Allocations. When the Tennessee Valley Authority Act was passed in 1933, the directors of TVA were required to allocate their investment costs to flood control, navigation, fertilizer production, national defense, and development of power. There were several interesting characteristics of this allocation requirement. Congress did not say that electricity production was the main purpose of TVA. The directors were required, indeed, to regulate the flow of water "primarily for the purpose of promoting navigation and controlling floods." Taking account of the low official rating of electricity production, TVA directors were not forced to assign a large part of the joint investment to the electric purpose. Second, the directors of TVA, rather than some other administrators, were authorized to allocate the joint investment. They could fix the amount of the public investment that would be amortized out of electricity revenue. Third, the directors were not required to report any investment allocations until January 1, 1937. Although they did not complete the allocation job until after 1937, the directors announced the regular wholesale and retail rates beforehand. They fixed the electricity prices before the investment costs were determined; the prices were not based on the total costs of service.

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* Commissioner Nelson L. Smith, who dissented from the decision, said, "Since the purpose of the allocation is to provide a basis for the rates to be charged, it would manifestly be putting the cart before the horse if the allocation were to be found on some preconception as to desired rates."[16]

Before the TVA directors solved the joint investment problem, they examined many cost data and numerous methods of allocation.[17] First, the "direct" or nonjoint investments were separated from the joint investments for each purpose. The investments in power plants, transmission lines, channel dredging for navigation, and other expenditures were classed as nonjoint investments. But no one could say just where the joint investment ended and the nonjoint investment began. Next, the directors decided to make investment allocations for the whole project rather than separate allocations for each dam and reservoir. This choice was sensible: the TVA really built an integrated system of dams and reservoirs. The run-of-the-river dams, which were designed to provide a nine-foot navigation channel from the Ohio River to Knoxville, were obviously unified. Even the high dams on tributary streams were closely related to the low dams; they controlled the water flow of the Tennessee River, and affected the electricity production and navigation use of the run-of-the-river dams. Operating together, the TVA dams and reservoirs were treated as a unit when the joint investment allocations were made.

Several methods of joint investment allocations were examined and rejected. Desiring to fix high prices for TVA electricity, private companies proposed an allocation of all investments to electric service, and an "incremental charge" theory that involved only small allocations to navigation and flood control.[18] The directors of TVA not only passed over these private proposals, but also rejected allocations that were based on dam uses and the values of project benefits. They finally chose a sort of alternative cost standard of joint investment allocation. Professor Glaeser called it the "alternative cost avoidance" theory.[19] When minor adjustments were made in Glaeser's version of the procedure, it was given an even more impressive title, the "alternative justifiable expenditure" theory. Unlike the other proposals for investment allocations, this alternative cost procedure took account of the economies of joint-purpose undertakings. The supporters of the idea, in fact, tried to allocate joint investments in proportion to the joint production economies of flood control, navigation, and electricity. First, estimates were made for single-purpose projects for flood control, electricity production, and navigation. These were hypothetical investments under an imaginary condition of nonjoint production. Next, the nonjoint investments—the actual and direct investment costs for the existing TVA project—were deducted from the estimated investments in single-purpose undertakings. These "remainders" were the basis for joint investment allocations.

The following investment allocations (which are listed in thousands of dollars) describe the TVA procedure:[20]

	Navigation	Flood control	Power	Total
Total alternative cost	$163,520	$140,826	$250,096	$554,442
Direct costs	45,214	33,763	110,977	189,954
Remaining alternative cost	$118,306	$107,063	$139,119	$364,488
Per cent	32.4	29.4	38.2	100

The estimated investments in single-purpose projects, the so-called "alternative investment costs," are given in the first line. The direct, nonjoint investment costs of the actual TVA system are deducted from these alternative investment costs. Then the "remaining alternative costs" are converted into percentages which represent the joint investment allocations to each of the three purposes. TVA directors did not adopt the percentages that are given in this illustration. Making some adjustments of the alternative cost calculations, they chose initially the following allocations of the joint investments in all dams: 40 per cent for power production, 36 per cent for navigation, and 24 per cent for flood control.[21] In 1945, after several important dams were added to the system, the allocations were 40 per cent to power, 30 per cent to navigation, and 30 per cent to flood control.[22] The investment allocations to flood control and navigation were re-examined as each dam or group of dams was finished, but the percentage allocation to the power purpose was not altered.*

The alternative cost method of investment allocation depends on the imaginary alternative investments. When each alternative investment is measured, the most economical equipment and location should be chosen for the single-purpose plant. In the TVA allocations the imaginary, single-purpose plants for electricity production are hydro plants. Yet, when the plant is used for electricity production alone, a steam generating plant may be more economical in the Tennessee Valley. Perhaps the high storage dams can produce electricity just as cheaply as steam plants can produce it. But the low-head dams along the Tennessee River doubtless cannot turn out electricity so cheaply as it can be produced in steam plants. At any rate, we come back to a familiar idea: even if an alternative cost method is carefully applied, it is still an arbitrary method of joint investment allocation. Economies of joint production are economies of total production; they are not the economies for segregated parts of the total output. For this reason the alternative investments in single-purpose projects are not related to the economies of multiple-purpose enterprises. Even though these alternative investments measure the maximum investment allocation to any joint purpose, they do not provide indisputable allocations of the production economies. Perhaps the alternative cost procedure is a practical method of cost allocation. At least it has one advantage over other allocation methods: it is based on a recognition of the main allocation problem, the allocation of joint production economies.

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* These were meaningless changes as long as the electric rates and the percentage allocation to the power purpose did not change. Nothing happened to TVA service as a result of the varying allocations to navigation and flood control; the allocations did not alter the flood control and navigation service. Revisions of the joint investment allocations became empty political ceremonies.

THE COST-PRICE RELATIONSHIP

Dividing the joint costs between different investment purposes, the public administrators fix the total amount of costs that they want to collect or can collect from electricity consumers. This is a private relationship of costs and prices; the prices are supposed to be high enough for the investment cost to be liquidated out of the electricity revenue. Other cost-price relationships are possible for public electric service. Congress or the project managers can choose some social standard of pricing whereby the electricity revenue and costs are secondary or even minor considerations. They can emphasize service production, seeking the maximum possible consumption of service or trying to equate the prices to the marginal costs of production. Several possible relationships of costs and prices are discussed in the remainder of the chapter.

Self-liquidating Investments. Congress already has a cost-price relationship for the regional electric projects: it wants to liquidate the electric investments out of electricity revenue. When the electricity earnings are large, the whole investment can be liquidated. The pricing of Boulder electricity, for example, assures nearly full liquidation of the dam and reservoir investments. The Boulder project is an exceptional example of public-investment liquidation, because a secondary purpose, electricity production, provides nearly all the revenue for investment amortization.

Congress wanted the TVA to be self-supporting "as soon as practicable."[23] Even the TVA's "surplus power shall be sold at rates which, . . . when applied to normal capacity of . . . power facilities, will produce gross revenues in excess of the cost of production. . . ."[24] Congress is not certain, of course, to amortize the investment in every undertaking. Yet even when the electricity earnings are small and are increasing slowly, Congress still wants to liquidate some of the public investments.

Amortization of public investments follows a common private principle of price control. If a private firm makes the most of its market situation, its earnings are maximized. A maximum difference between total revenue and total cost—maximum profits—is the uppermost objective. Perhaps a private firm may be satisfied with something less than maximum profits. But the minimum desirable objective of the firm is an equation of total cost and total revenue. When total revenue is less than total cost, the company does not "earn" its depreciation expense or obtain a full return (either in interest or dividends) on its investment; the past investment is not fully amortized. Viewed in terms of general pricing principles, self-liquidation of public investments is the same thing as the minimum objective—the equation of total cost and total revenue—of private firms. This sameness is evident even when the depreciation costs of public and private systems are measured differently, even when the full electricity investment of a multiple-purpose project depends on joint investment allocations.

If the lawmakers and administrators adopt a private method of price determination, the choice can be explained by the social institutions of the country. A preference for self-liquidating investments grows out of the individualistic nature of our society; it is a good capitalistic choice. Since private enterprise is dominant, the standards of private business often guide the proprietary functions of American government agencies. These private rules are used both to fix managerial principles for public enterprises and to evaluate the accomplishments of the public systems. The transfer of private standards is most apparent, of course, in those undertakings that the public and its legislators consider traditional private enterprises. Since electricity still is commonly produced by private corporations, the regional electric projects of the federal government naturally are managed more in a private than in a social manner. Now, when large-scale public production of electricity is still in its infancy, the lawmakers trust largely the rules that are used by private firms. As long as political morality is closely affiliated with private enterprise, some objectives of private companies are bound to be adopted for public undertakings. And businesslike relationships of cost, prices, and revenue will affect the management of the TVA, the Columbia Basin, the Central Valley, and lesser projects until political values are revised.

A Flexible Standard of Investment Liquidation. Another policy can be chosen: a loose rather than a definite relationship can be maintained between costs and prices. Following this policy, administrators are not determined to liquidate the maximum possible amounts of their project investments; they are not willing to charge any prices, particularly higher prices than the private companies charge, so that electric investments can be repaid. Nor are they completely indifferent to recovery of the public investments. Seeing low prices and service extensions as good social objectives of public electric service, these men do not choose prices that provide the maximum differences between current revenues and current costs, that afford the largest possible repayments of the public investments. Recognizing the general political interest in self-liquidating enterprises, they also aim to make some repayments of the joint investments. A political compromise is chosen between self-supporting projects and social control of electric service; the private standard of repayable investments is tempered, but it is not abandoned altogether.

Congressional legislation allows several possible modifications of the self-liquidating standard. First, Congress does not prescribe how much of the joint-purpose investments shall be amortized out of electricity revenue; the measurement of the electric investments is left to the administrators and their experts or to the Federal Power Commission. The investment allocations can be trimmed to fit some social objectives of the public power programs. Second, Congress does not specify how soon the full amortization of electric investments must begin—how soon the total revenue must equal or exceed the total cost of each project. This managerial latitude is necessary because the large-scale undertakings usually begin to produce electricity before large markets are available. It also affords a way to establish low prices before anyone can prove definitely that the electric investment cannot be amortized with them. Third, Congress does not forbid notably low prices—lower than any private companies charge for electric service. These low prices are the only way in which some new markets can be developed; they may provide the largest amortization, too, of the investments. Yet the allowance of price experimentation gives the administrators opportunities to choose prices that they like, and requires the opponents of public production to wait a long time for evidence that the self-supporting standard is or is not respected.

Trying to avoid political troubles, administrators of multiple-purpose projects naturally avow an interest in self-supporting electric service. They anticipate large future increases in revenue, argue the long-run gains of low prices, and never admit any manipulations of the joint investment allocations. Yet the electricity prices sometimes were chosen before the allocations of joint investments were made. This was the case with prices for TVA service which were chosen even before investments were made in many of the dams. And the price-makers of TVA considered other objectives than simply an equation of total cost and total revenue: they wanted to attract public distributors of electricity, to extend the limits of rural electrification, and to enlarge greatly the consumption of residential buyers. The prices of Bonneville electricity were chosen, too, before the joint investment costs were allocated—and long, long before anything was clearly known about the demand for Bonneville service. Indeed, the later allocation of Bonneville investments seemed to be a case of trimming the electric investment to the electricity prices; half of the joint investment was allocated to the unimportant navigation purpose. These comments show the looseness of the self-liquidating standard, but they are not arguments against public service. The cost-price relationships for TVA and Bonneville are not undesirable merely because they are not copied from private business. Low prices may bring in more revenue than higher private prices; or, failing to minimize the net revenue, low prices and additional electric service may be socially preferable to a larger investment amortization with higher prices.

Full Use of Electric Plant. If Congress or project administrators want a substitute for the prevailing public policy, another general objective of public electric service can be the full use of the electric generating capacity. In its simplest form this objective is unrelated to the past and present expenditures on electric service. The prices of electric service are fixed so that the buyers can consume all the available electricity. There are two controls of prices: the demand for electricity, and the available plant capacity for electricity production. If the demand for electricity increases, the prices for electricity increase too. And when the demand decreases, the prices are reduced so that the consumption is maintained. If the project has an extraordinary amount of public generating capacity, the electric prices are lower than when plant capacity is scarce relative to the demand for it. When the objective is full use of electric service capacity, prices are chosen so that the available plant capacity is equated to the demand for service; prices are used to ration the available electricity according to the prices that buyers are willing to pay.

A noncost basis of price control seems strange to most Americans. They are so much accustomed to privately controlled prices that they cannot comprehend the sensibility of any other procedure. Their thinking is controlled by capitalistic standards of pricing. Costs are the "proper" controls of prices; prices are designed to obtain earnings for an enterprise, not to distribute services. Yet the multiple-purpose projects do not always base their prices on the service costs. Boulder electricity prices, for instance, are not controlled by the production costs of electricity. Even though the Boulder prices are chosen so that they amortize a selected amount of investment cost, they are based on the service demands rather than the service costs. When prices are chosen so that the maximum use of electric plant is achieved, they are determined in the same way that Boulder prices are determined. But the Boulder prices and maximum-use prices have different purposes: the Boulder prices are designed to amortize a certain amount of public investment, but the other prices provide complete utilization of the available generating capacity.

The objective of maximum service, rather than the alternative objective of maximum revenue, seems to be right for some federal projects. Complete use of electric plants obviously provides the largest possible service of the plants. A number of projects are located in thinly settled areas, and cannot serve large cities or many industries. The Fort Peck, Big Thompson, Kendrick, and Grand Coulee projects, where electricity is essentially a by-product of other services, have much unused plant capacity. Other projects, such as Bonneville and Central Valley, also show some evidence of excessive plant capacity. Disregarding the past investments and not making investment allocations to electric operations, Congress and public administrators can choose the social rule of maximum service for these plants. They can choose this rule because rural, industrial, and domestic consumption of cheap electricity is socially more attractive than idle plant capacity. If the objective of full use of plants is chosen, the prices for electricity must decrease so that new uses of it can be developed. For some projects the excess capacity may be so great that full use of plant can be realized only after the prices are reduced to a record-making level. When a project has a large amount of unused generating capacity, the public administrator must be satisfied with what a private company manager may consider low-grade uses of electricity.

Full use of available resources is not a new aim of public enterprises. Toll bridges and toll highways are no longer common. Nor are tolls collected from the barge and boat operators on improved waterways. Congressmen accept the fact that the political manipulations of river and harbor appropriations determine the waterway investments. And after public investments are sunk in waterway improvements such as the Mississippi Valley system, government attention turns to development of waterway traffic rather than repayment of the investments. The public school, offering tuition-free service, provides most of American education. And low postage rates put communication service within the reach of everyone. Even a business-minded government sometimes places the use of resources ahead of the revenue from public services. The objective of maximum electricity consumption can be, indeed, a basic distinction between public and private electric service. A private company must be interested in earnings. If it is not, investors shun it and it passes out of existence. But a public project is not dependent on earnings unless Congress requires attention to revenues and costs.

MARGINAL-COST CONTROL[25]

Seeking the maximum utilization of available plant capacity, a project administrator equates electricity prices to the demand prices of the consumers. The prices are fixed so that the available output is purchased by the buyers who are most anxious to get it. But demand control of electricity prices obviously disregards the costs of service; even the "out-of-pocket" costs or the variable costs are ignored. Perhaps when the project has a large plant relative to the demand for service, the total revenue is less than the total variable cost. If this is true, production of service costs more than no production; stopping the production and sale of electricity, the administrators reduce their deficits. Because the current government outlay exceeds the current electricity revenue, the government continues, in fact, to make investments in electric operations. Some cost control of public prices can eliminate these deficits. For one control the government can prescribe an equation of current expenditures and current revenue. Or it can prescribe a marginal-cost control of prices, and not allow production to expand beyond the point where marginal cost and demand prices are equated.

The Equation. An equation of demand prices and marginal production costs affords a social standard of pricing. When this sort of equation was discussed in Chapter 20, it did not seem to be well suited to private companies. It did not assure financial successes and avoidance of receiverships; an equation of marginal costs and prices seemed to limit private investments and plant expansion, because a scarcity of plant capacity led to higher prices and afforded a better chance for profitable operations. Can the equation be expected to work better for a public project than a private firm? The answer is yes. (This does not mean that Congress and public administrators are ready to adopt the pricing standard.) It can be made to work more effectively because joint investments and public management are not directed toward money-making in the same sense that private firms are. A public project does not reduce its electric plant and curtail output just because the total revenue is less than the total costs. Maintenance or even expansion of service is an important purpose of public enterprises.

An equation of marginal cost and demand prices can be adapted to public electric service. At least a crude adaptation can be made. Like a private firm (as described in Chapter 20), a public enterprise may use both demand and marginal-cost controls of prices. The minimum price is controlled by the consumer demand: the average price of service never is lower than the demand price at which the total available service can be sold. The minimum price at any time is the price that consumers are willing to pay for the maximum possible output of the existing plant. Otherwise the prices for public services are equated to the marginal costs of producing them, particularly when the project has much unused plant capacity.*

The discussion here assumes the existence of a basic plant—at least a dam and reservoir. This assumption, which simplifies the reasoning and serves to concentrate attention on the fullest possible use of available plant, does not tie the marginal-cost control of prices to the larger problem of investment control. Investments may be determined by regionalized politics, a public works program of compensatory spending, a primary public interest in flood control or irrigation rather than any direct concern for public electric service, a gradual political movement toward a nationalized electric industry, or some other consideration that has no connection with marginal-cost control of prices. Marginal cost is chosen for price regulation after the investments are made. Yet, as R. H. Coase emphasizes,[27] the marginal-cost method must be associated with investment plans if it is to be efficient and to be conceived as a permanent economic policy. In his reasoning a maldistribution of resources develops when a factor of production does not yield a price in one use that is equal to its available price in any other use—when, for example, the prices for public electric services are below the prices that can be obtained elsewhere in the economic system with the same production factors. And where marginal-cost control in a decreasing cost situation fixes prices below the total factor costs, a redistribution of income occurs; the difference between the cost and revenue of public electric service is covered by tax revenue or by reducing public expenditures elsewhere.† As a matter of either liberal political thought or economic reasoning the shift of income and resources from one region to the other must be limited. Even if they are omitted from this study, problems of factor allocation and income distribution are parts of a long-time program of marginal-cost pricing.

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* As some economists suggest, marginal (incremental) costs of production can be used to regulate commodity prices under socialism.[26] Public production of electricity is a bit of socialism in a capitalistic society. Thus, if marginal costs are efficient means of price control in a socialistic system, they can be efficient regulators of public electricity prices in our society.

† Wanting to use marginal-cost control of prices, Coase gets around these cost-price and income difficulties with a "multi-part" form of pricing.[28] In his multi-part pricing one charge covers initial (including fixed) costs of output, while successive units of service are priced at their marginal costs. He compares this differentiation to well-known pricing practices among private public utilities, but he does not specify which practices he has in mind. If he means to include block-price schedules in his comparison, then marginal-cost control of prices, as I show in Chap. 28, is associated with monopolistic and discriminatory pricing.

A workable definition and measurement of marginal cost is a primary need. Just as the measurement of marginal production cost is a difficult managerial task under private production, so the administrators of public projects can be troubled by marginal-cost computations. Speaking in general terms, economists say that the marginal cost of production is the additional cost of producing an additional output. It is the increment in total cost that is associated with an output increment. Using a more technical definition, an economist says that the marginal cost of the x^{th} output unit is the difference between the total cost of x and x-1 units. But neither a public nor private manager can measure precisely the marginal cost for each kilowatt-hour of total production. There is a real difference between discussion and administration of the marginal-cost idea.* At any rate, economists must be satisfied with something less than perfect measures of marginal cost.

The marginal costs of electricity production can be measured in such a way that the public administrator escapes the problem of a joint investment allocation, but does not ignore the investments in turbines, transmission lines, and other electric equipment. The investments in joint-purpose dams and reservoirs are given conditions of the pricing problem. The dam and reservoir investments are not counted among the cost increments that are incurred for prospective increments in the electricity output. Cost increments are incurred as the separable electric plant is built, and as the electricity market expands. The project builds a powerhouse and installs at least one generating unit. This increment in investment cost, which is a large lump sum, is associated with an anticipated increment in sales. The construction of a transmission line here, a substation there, and other equipment elsewhere are other increments, too, in service costs. And the project also incurs irregular increments in operating costs, chiefly labor and raw material costs, as the plant grows and the output expands.

Counting both the investment costs and operating expenditures, the administrator does not have a strictly short-period measure of marginal costs. And he must translate the additional investment costs into a marginal cost per unit of additional output. To measure the marginal depreciation cost, the project administrator can estimate the probable service life of the new equipment, compute the annual depreciation cost, and anticipate the average future addition to the annual total output.* When the anticipated addition to the annual output is divided into the annual depreciation cost, a rough measure of the marginal depreciation cost is obtained. A similar measure can be made for the marginal investor return: the annual addition to interest charges or reasonable dividend payments is divided by the anticipated addition to the annual total output. And the marginal costs of management, general labor, plant maintenance, selling, and raw materials can be measured for each output addition, though the exact nature of the cost-output relations cannot always be ascertained. Such measures of marginal costs are approximations. Yet the measures may not be so rough that the administrator cannot follow the general principle of marginal-cost control of prices.

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* In actual practice the marginal costs can be measured for separate classes of customers, separate areas of service, and separate generating plants. Since they already use uniform prices for identical or similar services, public administrators do not want to measure the costs for separate generating plants or towns. But they want to compute the costs for the several classes of customers. An assumption, which simplifies the discussion in Chap. 20, is used here: a single curve of marginal costs is measured for each public project. Marginal costs of production are assumed to be alike for all customers.

If he uses the marginal-cost method of price control, the public administrator is interested in the successive cost additions for only one reason. He wants to incur cost increments up to the point where the marginal cost is equal to some demand price of the buyers.† This is illustrated in Figure 28. The marginal costs for outputs OQ_1 and OQ_2 do not give the project administrator the information that he wants for the determination of prices. He wants the marginal cost which is equal to one of the demand prices on the demand curve *D*. He wants to limit output to OQ_3, the point where marginal cost, expressed by the unrealistically smooth curve *MC*, is equal to a demand price of the consumers.

The Plant Rental. In this example the investments in dams and reservoirs do not affect the marginal-cost measurements; nor do they determine the prices. But this does not mean that revenues are insufficient to repay the investments in the dams and reservoirs. A rental can be earned on this part of the public plant. A rental is earned if the total costs, excluding the depreciation and interest costs of the dam-reservoir

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* As it is used here, the notion of an anticipated output has mainly a technical or engineering meaning rather than an economic meaning. It is not related to consumer demand; it is not the service that connsumers are expected to buy in the future. The anticipated output is controlled chiefly by the available plant capacity and the unavoidable (or necessary) amount of unused plant capacity. To measure the anticipated addition to annual total output, the administrator computes the maximum possible capacity of the additional plant, and subtracts sums for (1) breakdowns or managerial mistakes, (2) unused plant capacity during off-peak periods, and (3) a reserve plant capacity for sudden demand increases.

† Do not forget that the prices can be controlled either by the demand prices alone, or by an equation of marginal costs and demand prices. After a project incurs a large cost increment (e.g., the investment cost of a steam generating plant or a long transmission line), the price of service does not necessarily drop back to a low level. The public prices for electricity are never lower than the prices at which consumers are willing to buy the available service.

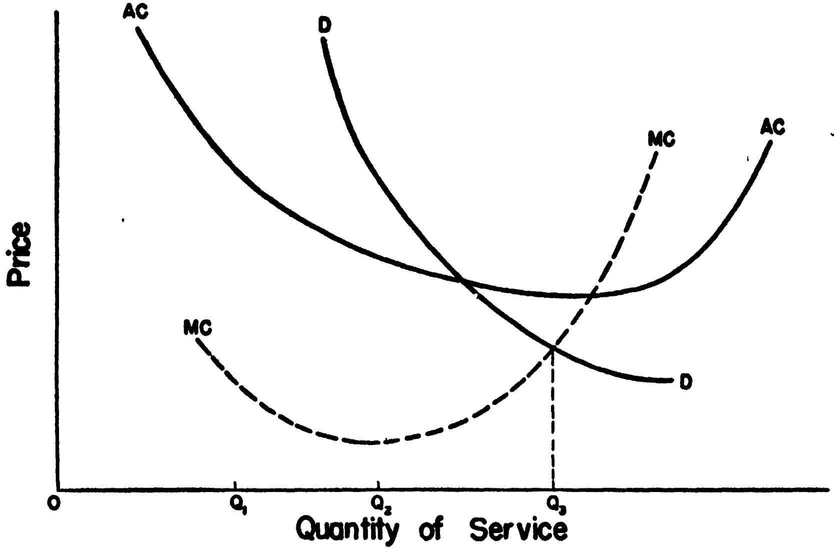

FIG. 28.

investments, are less than the total revenue from the service. When the electric production capacity is scarce relative to the demand for service, a public project is likely to obtain a plant rental. If Boulder electricity prices, for instance, are controlled by consumer demands alone or by both marginal costs and demand prices, the enterprise probably can earn a sizable rental. And the TVA, using both steam and hydro plants, certainly can obtain enough revenue to repay some part of the dam and reservoir investments. Some of the joint investment is retrieved, even though the prices are not calculated directly to repay a certain amount of public investment.[29] Other projects probably cannot earn a substantial rental or any rental at all. They are the undertakings that have much generating capacity relative to the demand for electricity. Yet they, like more favorably situated projects, can perform much more electric service if the objective of full amortization of public investments is relaxed.

When prices are equated to the marginal costs of service, some projects are certain to earn plant rentals. Even so, a plant rental may be smaller than the investment amortization under a more businesslike pattern of pricing. If the government revenue from electricity sales is reduced, either public expenditures on other services must be reduced or taxes must be increased. The incidence of low-priced electricity and more consumption of electricity falls on taxpayers; or other government enterprises and departments obtain smaller appropriations. These effects present a special fiscal problem: the benefits of low-priced electricity must be balanced against more taxation or smaller public expenditures. Our government does not formulate rational solutions for such problems. Nor does it devise tax structures that can minimize the burden of low-priced electricity on taxpayers. As Pegrum says, "Until taxation becomes more precise in terms of welfare there is little prospect of solving this problem."[80]

The marginal-cost method obviously does not provide an exact solution for the pricing problems of regional power projects. Observing this deficiency, some persons are not interested in the marginal-cost principle of price control. Private company managers, trying to support their bias against public production of electricity, can condemn the uncertainties of the pricing procedure. And even if Congress delegates broad controls of prices, the public administrator may prefer the political safety of the conventional pricing procedures. A private company manager overlooks the fact that the conventional measurements of costs often are inexact and arbitrary. He forgets, too, that he often fixes prices on the basis of estimated cost increments. And the public administrator forgets that his joint investment allocations are crude and arbitrary measurements of the electric service cost. At any rate, there is a difference between the principle of marginal-cost control, and a perfect equation of marginal cost and demand. The public administrator can be guided by the marginal-cost idea of pricing, even though he knows that a perfect application of the concept is impossible.

Knowledge of Demand Behavior. The demand of buyers is an uncertainty. Seeking an equation of buyer demand and marginal cost, the public administrator wants to know how much the output increases with each price reduction. The elasticity of demand is an important factor. Perhaps the administrator, who wants to utilize the excess capacity of his plant, guesses that the demand is inelastic. He reduces the price to the point where, at the expected output, it is equal to a marginal cost of production. But the demand, let us suppose, turns out to be elastic. The output is larger than it was expected to be. As long as the marginal costs are the same for both the expected and realized sales, no price change is called for. But when the marginal costs are increasing, the chosen price is too low; the administrator must increase the price to the point where demand and marginal cost are equal.

The elasticity of demand for electricity has a special characteristic: buyers take several years to make their full response to a price change. The full buyer response to TVA prices, for instance, extends over a five-year to eight-year period.[81] Knowing this characteristic of demand behavior, the public administrator wants to equate the marginal cost to the consumer demand after an allowance is made for the complete buyer reactions to a price change. This time shape of demand elasticity is illustrated in Figure 29. Before a price change is made, buyers pay a price of P_1 for electricity. D_1, D_2, D_3, D_4, and D_5 represent the consumer demand at one, two, three, four, and five years respectively after lower prices become effective. The elasticity of demand increases as the buyer response unfolds over the five-year period. If the administrator equates the marginal cost and the immediate demand, he chooses the price where D_1 and MC intersect. At the end of the first year the project sells the quantity OQ_1 at the price P_2. But at the end of five years the buyers are willing to purchase the quantity OQ_3 at P_2. Since the marginal costs increase beyond the output OQ_1, the price, P_2, does not equate demand and marginal cost. Only an initial price of P_3, which is determined by the intersection of D_5 and MC, takes account of the full buyer reaction to price reductions.

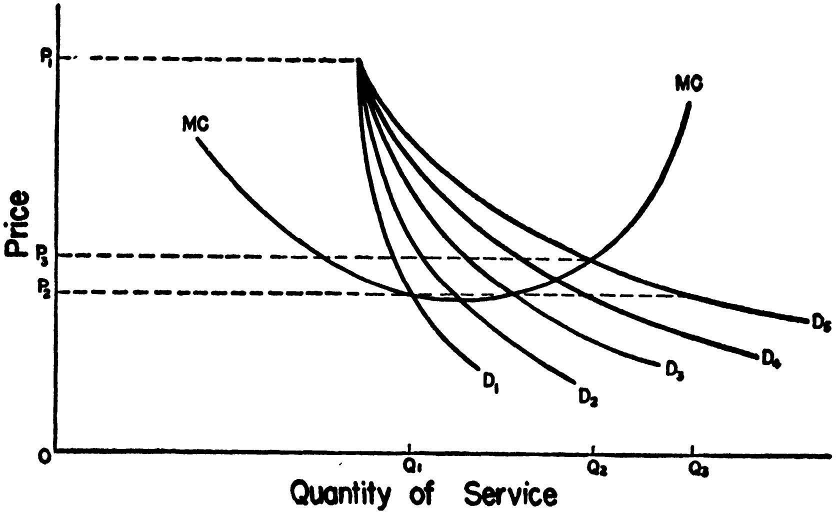

FIG. 29.

A similar problem is faced when the demand is increasing. The marginal cost of production can be equated either to the prevailing demand, or to some future demand. In Figure 30 the administrator, who uses marginal-cost control of prices and output, has a choice between the price levels P_1, P_2, and P_3. Insofar as increases in marginal costs are expected beyond the output OQ_1, he faces an upward adjustment of the price level when the prevailing demand, D_1, is used to determine prices. But buyers resist price increases for public electric service just as they try to prevent increases of private company prices. Knowing this fact about consumer behavior, the administrator can equate the marginal costs to the prospective demand. When the facts of Figure 30 are used, the best price is P_3. The price of Grand Coulee electricity, for instance, can take account of the prospective development and settlement of the Columbia Basin.* And when the administrator of any project equates marginal costs and buyer-demand prices, he can consider the changes in population, regional income, technical characteristics of appliances, and other possible causes of changes in the electricity demand.

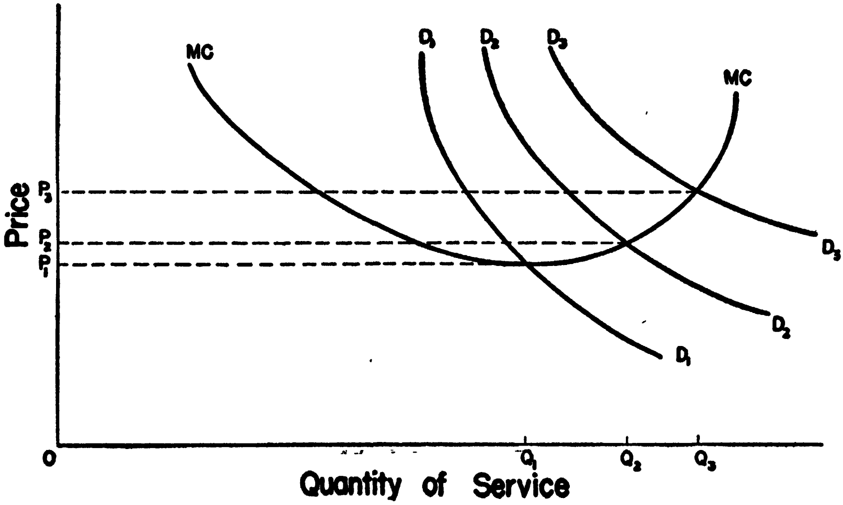

Fig. 30.

The Prospects. For public plants the marginal or incremental cost rule seems to afford a better social standard of pricing than is effected by the amortization of investments. Putting emphasis on electric service rather than public revenue, this standard offers a way to utilize public plants that have much unused plant capacity. Yet neither the marginal-cost method of price determination nor the objective of maximum use of public electric plants is acceptable to project administrators; they introduce social forms and purposes of pricing, but they are not attracted to this form. Most of the administrators, who are matter-of-fact men with at least one eye on political affairs, probably think that an idea such as marginal-cost pricing is too complicated and too dangerous politically for their pricing situations.[32] The marginal-cost method of pricing has some obvious, puzzling complications: measurement of marginal costs under varying production conditions, price adjustments as consequences of demand changes, price differentiations according to marginal-cost differences, and so on. Any new form of price control, lacking a long history of human experiences, has practical limitations. Political dangers are evident in this idea, too, because it does not conform to our capitalistic standards of private as well as public business. As long as revenue rather than production is the main end of private companies, it also is likely to be an important objective of public enterprises; consequently a successful public undertaking tries to amortize some of the public investment in electric operations. In any case, there is a political risk as a new and untried procedure is substituted for an old, tested, and even tolerable one. As matters stand now, the marginal-cost pricing is only another idea of economists that has no political significance and no evident prospect of political acceptance.

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* Administrators of large, new projects must take some chances on prices; at best they can make only rough estimates of future demands. Starting off with meager markets and wanting to make good political showings as quickly as possible, these managers are likely to underestimate the future demand—underestimate the prices at which the maximum output can be sold. Such low forecasts can disturb the continuation of marginal-cost pricing more than generous demand predictions. Guided by them, some projects eventually must choose between higher prices to restrict sales, rationing of sales, or plant expansion. Since the old customers are certain to protest increases in the prices to which they are adjusted, and since rationing or denial of new sales has some obvious political limitations, the choice is likely to be the construction of more plants. If the additional investments increase the marginal costs while the prices remain unchanged, marginal-cost control is abandoned. To avoid these uneconomical investments (uneconomical under either marginal-cost or average-cost control), the administrators must be studious and cautious as they make demand estimates.

Chapter 34

Prices of Regional-project Service

THE PRICES of service often are used to measure the achievements of public utility plants. When municipal governments sponsor and plan electric plants, they hope to get lower prices than the private companies charge for electricity. This price standard of public ownership holds, too, for multiple-purpose projects. Regional economic and political interests usually want a water-control project in part because they want low electric rates. Even if an immediate market for electricity is not available and even if its future demand is uncertain, the promoters of the projects emphasize the electric service economies. Any evidence of a possible electric market improves the case for a federal appropriation. And after the plant is finished and the public investment is sunk, the electricity consumers expect lower prices than the private companies are charging. Similarly, the public-ownership protagonists, who are anxious to make each project serve as an example for further planning of public electric plants, concentrate their attention on pricing policies.

SEVERAL GENERAL OBJECTIVES

Congress specifies several broad controls of the prices of regional-project electricity. The important ones are repayment of the electricity share of the joint investment, stimulation of the "widest possible" consumption of electricity, and preference for public or cooperative distributors of service. Congress does not prescribe definite ways in which these purposes are to be achieved. Consequently, just as a policy of public investment in multiple-purpose projects is not clearly outlined, neither is one of pricing delineated. Administrators scarcely can be expected to formulate definite pricing policies as long as the country's experience with public ownership is so limited. The experience of the federal government with electricity production and sales began only a few years ago, when the TVA started to develop. Although some experiences of the Ontario Hydro-Electric Power system and several large municipal plants could be used, the TVA worked out policies in a new field of American public administration. The TVA directors and other project administrators had another problem: confronting an immediate problem of selling electricity, they had to choose prices at once. They could not delay this choice while the results of cautious, refined reasoning were awaited. They were compelled to make expedient choices of prices, choices that were dictated at times by political considerations and at other times by the established private and public practices.

The Cost-price Equation Again. Electricity revenue of multiple-purpose projects (as described in the preceding chapter) is supposed to cover the cost of electricity production. For some federal projects, such as TVA, Congress explicitly states that the investments in electric operations shall be amortized. And the promoters of nonfederal projects, such as the Santee-Cooper system in South Carolina or the Little TVA development in Nebraska, plan to amortize their investments. Although these projects are not subject to federal control, they borrow federal or private funds and are expected to repay these debts. Acting like private enterprisers, regional-project administrators are supposed to choose prices so that total electricity revenue equals the total electricity cost. This price-cost equation is a significant part of the public pricing policy. Indeed, one of the directors of TVA, David Lilienthal, says that the first purpose of TVA is to get enough revenue to repay the public investment.[1]

The administrators of regional projects are not always able to fix and to maintain the cost-price equation. First, the total cost is bound to be an arbitrarily determined sum under a condition of joint production. Failing to find a way to distribute joint production economies to the several production purposes, project managers necessarily make arbitrary allocations of joint investment costs. Next, the administrators must measure the total revenue effects of different possible prices. Given the demand for a project's electricity, a manager or rate expert can measure the total revenue sums that can be obtained by charging different prices. But the demand for regional-project electricity—either the immediate demand or the future demand—is not fully known. If a conservative estimate of demand, based largely on the sales experience of private companies, is used, then the public prices are high and consumers do not consider the project a success. If, on the other hand, the electricity sales at different prices are generously estimated, then the administrators choose lower prices than the private companies have.*

* When the pricing policy of TVA was fixed during the thirties, a number of demand estimates for TVA electricity were made. Like other TVA practices, the problem of demand measurement soon became a controversy between private electric companies and TVA officials. Private companies argued, naturally, for conservative demand measures along the lines of their own experiences; TVA officials, influenced by social considerations and their unused plant capacity, made generous estimates of the present demand and the demand increases.[2]

Project administrators commonly make liberal estimates of the present and the future demands. But they do not present much tangible evidence of their demand measures—of the electricity sales that they expect to make at different prices. They do not calculate demand curves for their electricity. Rather, they usually express their demand expectations in a round, loose way. Sometimes, too, they choose attractive prices first of all, and then anticipate enough sales and revenue at these prices to cover costs. At any rate, the administrators take chances with the cost-price equation. The TVA directors unquestionably took a chance when they introduced remarkably low electric rates,* though the subsequent consumer responses seemed to justify the faith of the directors in their price choices. When projects were built in sparsely settled areas, the demand for electric service naturally was uncertain. The financial success of these projects depended on the future demand for services; the cost-price relationship of such undertakings was dependent on demand conditions ten or more years after the dams were completed. In the case of the Columbia Basin projects, for instance, the population and industrial growth of the area were not completely known. And the future demand (the quantities that will be bought at various prices in the future) for Big Thompson, Kendrick, Central Valley, or Fort Peck electricity was not estimated easily when the dams were completed and began to produce service.

Administrators of the regional projects were compelled to take chances on the amounts of electricity that they could sell at different prices. They could not make the "safe" price decisions that were so common among private companies. Unlike the private electric companies, multiple-purpose projects usually started operations with much unused plant capacity. That was a result of joint-purpose construction of improvements; electric capacity was acquired when dams and reservoirs were built for irrigation, flood control, or river transportation purposes rather than when the demand for electricity alone made the plant capacity useful. Consequently some of the projects—built primarily for irrigation, flood control, or water transportation—were located in areas where large and yet unknown increases in electricity demand were the only hope for an equation of total electric revenues and total electric costs. In other instances the best parts of the available electric markets were held by private firms. These companies commonly had enough plant capacity to serve all the consumers who were willing to buy electricity at the prevailing prices; at these prices the public plant capacity was excessive and unnecessary. A reduction of public electricity prices below private-company prices seemed to afford the best way to develop markets. Forced to take chances, the public administrators did what private firms, enjoying well-developed markets and substantial earnings, usually hesitated to do: they sought markets and more earnings with price reductions. Even when the private plants were acquired as in the Tennessee Valley, price reductions still were granted. Otherwise the project administrators could not eliminate unused plant capacity unless they waited a long time for large demand increases.

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* The TVA rates were not based on the Authority's electricity costs. Experiencing a municipal plant demand for electricity from Wilson Dam, the directors of TVA chose prices before the Norris, Pickwick Landing, Kentucky, and other dams were completed—and before a method of joint investment allocation was selected. Since cost information was not available, these rates were based on the experiences of the Ontario Hydro-Electric system and large municipal plants, and on advice from public-ownership interests and students.[8] TVA directors chose the rates that they wanted to choose.

Greater Electricity Consumption. For the TVA and other federal power projects Congress lays down another pricing objective: the "widest possible use" of electricity. This is a general rule to which Congress does not attempt to give a specific meaning. This objective obviously has a price dimension. As the prices for electric service are reduced, the buyers are willing to purchase larger and larger quantities of electricity. Price reductions are means of enlarging consumption, unless the demand is perfectly inelastic. The largest possible increase in consumption is realized, of course, when the service is given away. Yet, if electricity is free, the demand for service exceeds the available plant capacity; in this case Congress must choose between further plant investments and the rationing of electricity. Following the views of Congress, project administrators give some attention to service costs. Congress probably wants the largest possible use of electricity under price and revenue conditions that still allow amortization of the electric plant investments. If several price levels or combinations of price schedules bring in enough revenue so that the public investments can be liquidated, Congress apparently wants the price level and price schedules that provide the largest consumption of electricity.

Given a fixed earnings (amortization) objective, project administrators can vary pricing practices in two ways to get different sales and consumption effects. One of these is price differentiation with buyer classifications and price schedules. If the accepted public policy allows discriminatory pricing, prices for buyer classes can be differentiated with respect to demand elasticities. If, instead of uniform pricing, the prices are fixed so that the buyer class with the lowest demand elasticity pays the highest average price and the buyer class with the highest demand elasticity pays the lowest average price, then the electricity consumption is maximized for a given amount of revenue. Similarly, a greater consumption for a given amount of revenue is achieved by quantity-discount prices, scaled to fit the demand prices of buyers, than by uniform prices. Both forms of discriminatory pricing are used by public plants. The discriminatory pricing of public projects is described later in this chapter.

To facilitate the widest possible use of electricity in another way, the public authorities can experiment with low prices. They can search for the lowest possible price level at which a given amount of revenue can be obtained. Perhaps the project incurs a loss of earnings during the first year or two after price reductions go into effect; but after buyers have time to respond fully to the price reductions—to take account of the new prices and to buy appliances—the electricity sales begin to increase, and the revenue covers the electricity costs. If a long view instead of a year-by-year view is taken of the cost-price equation, the consumption of electricity can be increased. If they fix their revenue objectives for a decade or even a 25-year period rather than a single year, public administrators have opportunities to experiment with prices, and to discover some new limits of consumption. Following the path of the TVA, which dared to take a chance on remarkably low prices, public administrators now try to stimulate new uses of electricity and more consumption by old customers.

A Preference for Public Outlets. Except for the Boulder project, the multiple-purpose undertakings generally were expected to increase the public ownership of electric distribution systems. Before the public-ownership movement was extended to a regional or watershed scale of production, small municipal plants could not produce electricity so cheaply as large private companies could. After the multiple-purpose projects were built, the municipalities could buy electricity at prices that were far lower than the generating costs of small Diesel or steam plants. Congress wanted to assure the public distribution systems of low-cost electricity. Federal project administrators were required to show a preference for sales to public distributions systems—to sell to industries and private electric companies only when the municipalities, public utility districts, and rural cooperatives could not consume all the available output. This preference for public outlets was an important part of the TVA power policy. The TVA bought private electric properties, and sold the local distribution systems to the cities. There are two distinct levels of public ownership in the Tennessee Valley: the TVA produces and transmits electricity, and municipalities and rural cooperatives distribute service. A preference for public outlets also is shown elsewhere, though the development of public distribution systems usually is not so complete as it is in the Tennessee Valley. The Bonneville project, for instance, seeks more public outlets for electricity, but it does not yet have large public sales.

As long as unused or excessive plant capacity is available, a ranking of sales—public outlets, large industrial buyers, and finally private electric firms—is not an important matter. Even the TVA has more productive capacity than the municipal and cooperative buyers can use. Throughout the Second World War, a period of extraordinary increases in electric sales, the TVA sold more kilowatt-hours to industrial buyers and electric companies than to municipalities and cooperatives.[4] Perhaps some of the projects never will withdraw service from large industrial buyers, even though the demands of public distribution systems increase. The Columbia River projects, for instance, are not likely to curtail industrial service. Strong civic and business interests of the Pacific Northwest, which want to promote the industrialization of their area, are determined to prevent a withdrawal of industrial service or an increase in industrial buyer rates. If a choice must be made between public and industrial buyers, Congress will be asked to build more electric plants. No similar political or social force compels a regional project to maintain sales to electric companies. Yet, as long as some projects do not develop their own markets, they will continue, perforce, to sell service to private electric firms.

WHOLESALE PRICES

Regional power projects ordinarily do not distribute electricity locally, and come into direct contact with residential and commercial buyers. They sell electricity, instead, to public and cooperative distributors, industrial firms, and private electric companies. The wholesale prices determine how much service the multiple-purpose enterprises can sell; they determine how fully the generating capacities of the plants are used, and how rapidly some of the projects can spread out to envelop some markets that the private companies now hold. The choices of wholesale prices are important facts in a national program that fosters public ownership. They determine how much the distribution systems must spend for electric service, and how low the retail electric rates can be.

Prices to Public Agencies. Before the TVA, Bonneville, and other projects perform wholesale electric service, they negotiate contracts with the public or cooperative buyers. A term of twenty years is common for the contracts. Although the wholesale prices are the most important items in the contracts, the TVA and Bonneville agreements cover matters of service, accounting, maximum earnings, disbursements of cash, and resale rates. The administrators of the regional projects, who are free to choose whatever prices they please under the authority delegated to them by Congress, prefer relatively simple schedules of wholesale prices. Nothing so simple as a uniform price for each kilowatt-hour is used. Yet, even though demand charges are a common characteristic of the schedules, the pricing forms are less complicated than numerous private schedules for large buyers. The same schedule commonly is used, moreover, for all public buyers; rural cooperatives and municipalities pay the same prices for equal amounts of electricity. And the projects usually do not differentiate between public buyers according to transmission distances. Even if a city in the Tennessee Valley, for example, is only a few miles from a dam, it still has the same price schedule as one that is a hundred or more miles away. Preferring geographic uniformity of price schedules, the public systems practice what is known as "postage stamp" pricing.

The TVA schedule for public and cooperative buyers is a two-part, Hopkinson type of schedule. This form of pricing has been used by private electric companies for many years. The standard form of the TVA schedule is:

Demand Charge: 90 cents a kilowatt of demand each month.

Energy Charge:	First	100,000 kw.-hrs. each mo.	4.0 mills a kw.-hr.
	Next	200,000 kw.-hrs. each mo.	3.0 mills a kw.-hr.
	Next	700,000 kw.-hrs. each mo.	2.5 mills a kw.-hr.
	Over	1,000,000 kw.-hrs. each mo.	2.0 mills a kw.-hr.

Minimum Bill: The amount of the demand charge, but not less than 60 per cent of the highest demand charge during the previous twelve months.

A demand charge of 90 cents a kilowatt of demand each month is a common demand charge in all TVA wholesale schedules; large industrial buyers as well as public distributors often pay this charge. The demand for a month is the average load in kilowatts that is measured during the highest one-hour period of consumption.* If two public outlets purchase the same number of kilowatt-hours but have different load factors, the one with the highest load factor pays the highest demand charge. Like the private electric companies, the TVA uses a demand charge to allocate its fixed costs, and a high minimum bill to maintain its revenue. The TVA gives a load-factor discount, furthermore, to some public distribution systems. A discount of 0.5 mill a kilowatt-hour is granted when the load factor of a buyer is above 50 per cent—when the purchases exceed 360 (one-half of the 720 hours in a thirty-day month) times the measured maximum demand.

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* The contracts commonly fix a maximum kilowatt demand for each public or cooperative buyer, though the TVA allows increases in the maximum contractual demand under certain conditions. A maximum demand of 2,000 kilowatts, for instance, may be specified in a contract.[5] The TVA agrees, however, to allow larger purchases on written requests when the power is available. But after the TVA fixes, for example, an initial maximum of 2,000 kilowatts, it is not obligated to provide an additional 5,000 kilowatts on less than 12 months' notice, or an additional 10,000 kilowatts of power on less than a two-year notice. Thus the contracts control the allocation of the TVA's output.

Public and cooperative buyers of Bonneville electricity, which is cheaper than TVA electricity, have a choice between several rate schedules.[6] (These rates, like the TVA rates, were fixed before the Bonneville Administrator knew either the demands or costs of service.) For firm power, which is available at all times, the municipalities and public utility districts can buy electricity at these prices:

Demand Charge: 75 cents a kilowatt of the billing demand each month.
Energy Charge: 2.5 mills a kilowatt-hour up to 50 per cent load factor.
1.0 mill a kilowatt-hour for all additional purchases.

The monthly "billing" demand, on which the demand charge is based, is the highest of three demands, either the contract demand or the actual demand or the "computed" demand. The contract demand, which is specified in the contract, is the amount of service that the administrator is obligated to deliver at any time; the actual demand is the average kilowatt delivery during the largest thirty-minute consumption of a month; and the "computed" demand is a special measure that takes account of the buyer's own facilities for electricity generation. A buyer is obligated to pay a minimum bill that is equal to 75 cents a kilowatt of contract demand, but not less than 75 per cent of the highest demand charge during the preceding eleven months. A public buyer does not pay a minimum-bill charge during the first two years of service, a time when a resale market is being developed. In these years the towns and cooperatives are charged a maximum price of 5 mills a kilowatt-hour. This rate schedule is designed for distribution systems with low load factors. It is the best choice, consequently, for many rural cooperatives and municipal distribution systems.

Another Bonneville electricity price is the best choice for public buyers who have load factors above 45 per cent. The price for transmitted power is simply $17.50 a year for each kilowatt of billing demand. To Americans, who expect electricity to be sold in kilowatt-hour units, an electricity price in kilowatt units seems strange. Yet this form of pricing is used in the contracts of the Ontario Hydro-Electric Power Commission. And except in the first two years, when the price is limited to a developmental charge of five mills a kilowatt-hour, the minimum monthly bill is one-twelfth of $17.50 a kilowatt of the contractual demand. When they are within fifteen miles of Bonneville Dam, the public buyers can purchase electricity at a price of $14.50 a year for each kilowatt of billing demand.* Since most public buyers are more than fifteen miles

* Buying electricity at the Bonneville Dam site and reselling it for irrigation and drainage pumping, Bonneville customers also can choose another schedule: 75 cents a kilowatt of billing demand up to a maximum of $4.50 a year, 2.5 mills a kilowatt-hour up to a 50 per cent load factor, and one mill for each additional kilowatt-hour.

from the dam, this price can be more useful for industrialists than for municipalities and public utility districts. Finally, public buyers can purchase "dump" or surplus power at a uniform price of 2.5 mills a kilowatt-hour. But rural and municipal distribution systems usually must depend on firm power, which is available at all times, rather than on dump power, which is delivered at the discretion of the administrator.

Prices to Industrial Buyers. Industrial firms, particularly several chemical companies and aluminum reduction plants, buy large amounts of TVA electricity. The Aluminum Company of America, the TVA's largest customer, contributes about half as much revenue as all municipal and cooperative buyers. Contracts for industrial buyers' service are not alike; they contain different term and cancellation conditions, firm power is not sold at the same price to all buyers, and the TVA naturally does not sell firm, interruptible, and secondary power at the same prices.[7] Yet some generalizations are possible. The contracts specify the maximum amount of electricity (kilowatts of demand) that the TVA is obligated to deliver at any time. Most of the contracts have ten or twenty-year terms. But the cancellation privileges of either party vary from contract to contract; several contracts allow a one-year notice of cancellation after a five-year period of service elapses, and several others require a five-year notice after ten years of service.

Several industrial contracts for TVA service contain the same wholesale schedule that is used for public buyers. The standard price schedule for public buyers is, in fact, the commonest price schedule for industrial buyers of firm power. And this schedule is used, too, for sales to other federal government agencies such as ordnance plants. Another schedule for firm power fixes a different demand charge and a uniform energy charge. The demand charge is $1.67 a month for each kilowatt of demand; the monthly demand still is the average kilowatt load that is measured for the highest thirty-minute period of consumption. When the industrial buyers purchase more than 360 kilowatt-hours for each kilowatt of demand in any month (i.e., when the buyers' load factors exceed 50 per cent), they are charged a price of 1.7 mills a kilowatt-hour for the excess. Under this schedule the minimum monthly bill is $1.67 a kilowatt of contract demand.[8] A third kind of firm-power schedule fixes a flat monthly price for a specified amount of kilowatt demand. In 1937 the Aluminum Company of America, for instance, signed a twenty-year contract to purchase 30,000 kilowatts of firm power at a monthly price of $60,000; and in 1940 the same company signed a ten-year contract to pay a monthly price of $200,000 for 80,000 kilowatts of firm power.*

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* The Aluminum Company of America can consume electricity steadily; it can have a 100 per cent load factor. If it does have a perfect load factor, a price of $2.50 a kilowatt

Another kind of TVA service for industries is called "interruptible power." As the term suggests, the TVA is not obligated to deliver electricity continuously throughout a year. But the Authority is obligated to deliver service a minimum of three hundred days a year, give notice of power interruptions as much as fourteen days ahead of time, and make only a small number of interruptions in each year. Since the Authority can interrupt service during the periods of low hydro-power production and thereby economize the use of its hydro dams, the price of interruptible power naturally is lower than that for firm power. The demand charge is only 30 cents a month for each kilowatt of demand, but the energy charges are the same as those in the standard wholesale schedule for municipal and cooperative buyers.

Secondary power, another kind of interruptible service for which the Authority promises delivery during only 75 per cent of a year, is sold at a still lower price. If the purchases do not exceed the contract demand, the customary price for secondary power is 6 cents a day for each kilowatt of demand. This price is not so cheap, however, as it seems to be. During a thirty-day period the buyer of secondary power pays $1.80 a kilowatt of contract demand, while firm power is sold at slightly higher prices under equivalent load-factor conditions. When the first contract was negotiated with the American Aluminum Company, another kind of discontinuous service was sold. During the last seven months of each year the TVA agreed to sell not less than 85 million kilowatt-hours at a uniform price of about 2.3 mills a kilowatt-hour.[9] When the TVA sells electricity for a few months or a year at a time, it does not include a demand charge in the price. Prices for temporary service have special differentiations: they are slightly higher in the first half than the last half of the year, and substantially higher from steam than from hydro plants.

Although the TVA looks on industrial sales as a secondary or even temporary business and prefers, instead, to promote sales to public outlets, the Bonneville project is anxious to enlarge its industrial sales. The business and civic groups of the Portland area are determined to attract industry with low electric rates. And the Bonneville administrators have their own reasons for wanting industrial customers: industrial sales are the only apparent means by which most of the Bonneville electricity can be sold. Bonneville rates for industrial buyers are lower, consequently, than TVA rates. Industries buy electricity at the same rates that cities

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of contract demand each month is equal to about 3.3 mills a kilowatt-hour. Yet, even if the Aluminum Company maintains a load factor of 100 per cent, a price of $2.50 a kilowatt of demand each month is not a remarkable bargain relative to other wholesale prices. If a buyer has a 100 per cent load factor, the average price is lower under the standard wholesale contract than at $2.50 a kilowatt of demand.

and rural cooperatives pay; for firm power the price is either $14.50 or $17.50 a kilowatt of demand each year according to whether the transmission distance is less or greater than 15 miles, and dump or surplus power is sold at a uniform price of 2.5 mills a kilowatt-hour. Electrometallurgical and chemical companies were attracted by these rates. In 1939 the Aluminum Company of America signed a large contract and began to build a plant on the Columbia River. Other industrial plants came to Bonneville electricity during the war; nearly all the Bonneville electricity was sold to industrial companies after 1941.[10]

Prices to Electric Companies. Until the demand of public and industrial buyers increases, some public projects must sell part of their electricity to private electric firms. The TVA has several important contracts with electric companies other than the agreements for interchanges of power. One of these, a ten-year contract with a Kentucky company, provides for the sale of both firm and secondary power. Under this contract the demand charges are slightly higher than in the standard wholesale schedule; a monthly demand charge of $5,250 is paid for the first 5,000 kilowatts of firm demand, and 90 cents a kilowatt is paid each month on additional demand.[11] Energy charges are 2 mills a kilowatt-hour for hydro service, and 3.5 mills a kilowatt-hour for steam service. The Commonwealth & Southern Corporation, the original opponent of TVA, buys a large quantity of power. Under this contract a demand charge of $36,000 a month is paid, the charge for steam power is 3.5 mills a kilowatt-hour, and the price of hydro service is 1.75 mills a kilowatt-hour.[12] Private electric companies buy more Bonneville electricity than is bought by the municipal and cooperative systems. Maintaining its policy of no price differentiation between wholesale buyers, the Bonneville project sells firm and dump power to the private electric companies at the same prices that the public and industrial buyers pay.

CONTROL OF PUBLIC DISTRIBUTORS

The TVA not only sells electricity at low prices to the municipal and cooperative distributors, but also regulates the distributors. When a city or rural cooperative contracts to buy TVA electricity, the resale prices, accounting, finances, reasonable earnings, and service standards of the distributor are subjected to regulation. Specifying regulatory conditions in the wholesale service contracts, the Authority standardizes and supervises the public-ownership practices of the region. The consumers of electricity pay the rates that the TVA chooses, the managers of the distribution systems cannot construct their own accounting systems, city governments are not free to take the earnings of municipal electric systems, and uses of earnings are circumscribed. Similar terms of control are written into Bonneville contracts, though the Bonneville Administration does not carry this regulation as far as the TVA does. Since the TVA controls are outstanding, the discussion is concentrated on them.

Resale Prices. Seeking to carry the pricing benefits of public power to consumers, the TVA specifies standard price schedules for several classes of retail service. The same schedules are designated for both rural and urban service; price differentiation between farm and city customers is not acceptable to the TVA.[*] Some cities and rural cooperatives are allowed to sell at higher price schedules than the standard schedules; others sell at lower prices. One price variation, which is provided for in all contracts, is surcharges for some consumers—flat percentage additions to the bills of commercial and industrial buyers. All rates in the standard schedules can be increased, too, if the city or cooperative does not get enough revenue to cover all the service costs. On the other hand, when the total revenue exceeds the total costs of a rural or municipal system, the price schedules can be reduced below the standard levels.

Price differentiation is practiced between the classes of retail buyers —between the residential customers, small light and power buyers, and large light and power consumers. The standard price schedule for residential customers is:

First	50	kilowatt-hours each month	3.0 cents a kw.-hr.
Next	150	kilowatt-hours each month	2.0 cents a kw.-hr.
Next	200	kilowatt-hours each month	1.0 cent a kw.-hr.
Next	1,000	kilowatt-hours each month	0.4 cent a kw.-hr.
Over	1,400	kilowatt-hours each month	0.75 cent a kw.-hr.

Minimum bill each month: 75 cents for each meter.

This block schedule of prices shows that the TVA, like the private electric companies, approves quantity-discount prices. Yet, when a new residential schedule is adopted by a prospering distributor, the first block price is reduced the most.[13] This is the lowest of two standard schedules for rate reductions by municipal and rural distributors: 2 cents for each of the first 100 kilowatt-hours, 1 cent for each of the next 250 kilowatt-hours, 0.4 cent for each of the next 700 kilowatt-hours, and 0.7 cent for any additional kilowatt-hours in each month.[14] Although the TVA approves quantity discounts, the small residential customers get the largest parts of the rate reductions.

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[*] There is one difference, however, between urban and rural rates. Rural cooperatives add an "amortization" charge to the rates of all their buyers, and a municipal system also adds the same charge to its bills for rural customers. This charge is 1 cent a kilowatt-hour for the first 100 kilowatt-hours of each bill, and is not less than 25 cents nor more than $1 a month for each bill. The revenue from amortization charges is segregated into a trust fund that is kept exclusively for the payment of bonds, notes, and interest charges.

The standard rate schedule for residential service contains an interesting feature: the price for each additional kilowatt-hour increases after the consumption of a customer exceeds 1,400 kilowatt-hours a month. It increases from 0.4 to 0.75 cent for each kilowatt-hour. The price of 0.75 cent for a kilowatt-hour is the average price of the first 1,400 kilowatt-hours. When most residential consumers buy 1,000 or even 1,400 kilowatt-hours a month, they have enough electricity for water heating and small-room heating as well as for lighting, refrigeration, cooking, and other appliance uses. Only a few residential buyers consume more than 1,400 kilowatt-hours a month. The large residential buyers have large homes and many appliances; some of them even may have special heating equipment. They are the buyers who have large incomes—who can afford large outlays for electricity.[15] Being buyers who can afford large expenditures, they do not get quantity discounts after their consumption exceeds 1,400 kilowatt-hours a month. This is price discrimination according to differences in buyer incomes; differences in the demand curves of individual buyers are the basis of price differentiation.

Commercial customers pay higher prices than those paid by residential buyers for equivalent amounts of electricity. When the demand, measured by the average load during the highest thirty-minute period of monthly consumption, is 10 kilowatts or less, the standard price schedule is:

First	150	kilowatt-hours each month	3.0 cents a kw.-hr.
Next	350	kilowatt-hours each month	2.0 cents a kw.-hr.
Next	1,500	kilowatt-hours each month	1.0 cent a kw.-hr.
Over	2,000	kilowatt-hours each month	0.8 cent a kw.-hr.

Minimum monthly bill: $1 a month for each meter.

When the demand is above 10 kilowatts and not more than 20 kilowatts, the blocks (which are computed as multiples of the measured demand) are larger than for a commercial buyer who has a 10-kilowatt demand.* But the kilowatt-hour prices for each block do not change.

The main differences between the residential and commercial schedules are in the sizes of the blocks and in the price of the last block. At each block price the commercial customers buy larger quantities of electricity than are bought by the residential consumers, because the typical commercial buyer is considered a larger consumer than the typical residential buyer. When the TVA rate schedules were constructed, the rate makers thought that the average commercial store of the region was equivalent to about five residential customers.[16] And the prices of residential service are scaled down to 0.4 mill a kilowatt-hour, while the lowest commercial price is 0.8 mill a kilowatt-hour. Consequently the large residential buyer can purchase TVA electricity more cheaply than is possible for the large commercial buyer.

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* Under these conditions the schedule is: first 15 hours of use of measured demand—3 cents a kw.-hr.; next 35 hours of use of the measured demand—2 cents a kw.-hr.; next 150 hours of use of measured demand—1 cent a kw.-hr.; and over 200 hours of use of measured demand—0.8 cent a kw.-hr.

When the demand of a nonresidential consumer exceeds 20 kilowatts, he buys electricity from a public distributor according to the large lighting and power rate that the TVA prescribes. More complex than the residential and small commercial schedule, this schedule is:

Demand Charge:	First	1,000 kw. of demand each mo.	$1.00 a kw.
	Over	1,000 kw. of demand each mo.	$0.90 a kw.
Energy Charge:	First	15,000 kw.-hrs. each mo.	8.0 mills a kw.-hr.
	Next	25,000 kw.-hrs. each mo.	6.0 mills a kw.-hr.
	Next	60,000 kw.-hrs. each mo.	4.0 mills a kw.-hr.
	Next	400,000 kw.-hrs. each mo.	3.0 mills a kw.-hr.
	Over	500,000 kw.-hrs. each mo.	2.5 mills a kw.-hr.

Minimum bill: $6 a year for each kilowatt of the highest monthly demand of the year.

The demand for any month again is the average load that is measured for the highest thirty-minute period of consumption.[*] Buying under this schedule, consumers get a 0.5 mill discount for every kilowatt-hour that they purchase above a 50 per cent load factor. And there is a similarity between this industrial schedule and the wholesale price schedule at which the public distributors buy electricity. The public and cooperative distributors pay a demand charge of 90 cents a kilowatt; their demand charges for industrial and large commercial customers are $1 and 90 cents a kilowatt. And the last three blocks of the power-buyer schedule have the same kilowatt-hour prices that are used for the first three blocks of the wholesale schedule.

Nebraska Electric Prices. Although public attention usually centers on TVA prices, the pricing practices of the Nebraska projects also are noteworthy. Producing electricity in three hydro projects and a number of steam plants and distributing electric service throughout Nebraska, these projects are next to the TVA in the breadth of their operations. But their price and service standards are not copied directly from TVA practices. The three hydro districts—the Platte Valley, Central Nebraska, and Loup River Districts which produce much of Nebraska's electricity —sell electricity through the Hydro Pool to rural cooperatives, municipal distribution plants, and as well as the Consumers Public Power District.[*] But the Hydro Pool (the Nebraska Public Power System) does not control its distributors as the TVA does. It does not fix the retail rates or prescribe accounting, financial, and service conditions for cooperative, municipal, and other public distributors of electricity. And prices for public electric service are partly but not wholly controlled by the Consumers Public Power District, the public agency that owns some of the local distribution systems and a large part of the transmission equipment.

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[*] When customers use electricity for no more than eight months a year, they have a different rate schedule. This schedule does not contain a demand charge. Consequently the buyers of seasonal service, such as the operators of cotton gins, pay less than the regular buyers for electricity.

The Consumers District performs several kinds of electric service. It sells at wholesale prices to a number of municipal distribution systems, some of which were bought or leased from the Consumers District. Unlike the TVA and some other federal projects, the Consumers District does not have the same wholesale price schedule for all municipal and cooperative distributors. The city of North Platte, which is adjacent to one hydro project, purchases electricity at the same prices that the Consumers District pays the Hydro Pool. Other cities or cooperatives, which do not have the alternative of buying directly from the Hydro Pool and must get service from the Consumers District lines, pay higher prices. The Consumers District sells electricity directly to residential, commercial, and industrial buyers in many towns. While the Consumers District fixes retail rates that are below the prior private rates, the prices are not so low as the TVA rates. Nor are the retail schedules standardized; they are differentiated by town sizes. Now the Consumers District seeks simplified schedules that are summed up in the table on the following page.[17]

Service Controls. The TVA requires periodic tests of customer meters by public and cooperative distributors. Other meter tests are made at the request of customers. If a customer asks for a meter test and the meter is no more than 2 per cent slow or 2 per cent fast, the customer pays a testing charge of $1 a meter; if the test shows a greater inaccuracy, the distributor bears the cost of the test and makes an adjustment in the customer's bill for the previous thirty days of service. The distributor can require customer conformance to specified wiring standards. And when

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[*] After a thirty-year contract was negotiated in 1941, the Consumers District bought all the electricity from the Hydro Pool that it could not produce in its own plants. At the same time the Consumers District leased several generating plants to the Hydro Pool, and agreed to pay enough for the electricity output so that the operating and maintenance costs of the leased plants were covered. To obtain electricity from other (the hydro) plants, the Consumers District paid higher prices:

Demand Charge: $1 a kilowatt of Consumers District demand.

Energy Charge:	First 5,000 kw.-hrs. each day	4.75 mills a kw.-hr.
	Next 10,000 kw.-hrs. each day	4.00 mills a kw.-hr.
	Next 35,000 kw.-hrs. each day	3.50 mills a kw.-hr.
	Over 50,000 kw.-hrs. each day	4.75 mills a kw.-hr.

Charges	Towns over 5,000 population	Towns with 1,000-5,000 population	Towns with less than 1,000 population
Minimum monthly bill	$1.00	$1.00	$1.00
Kw.-hrs. included each month in the minimum bill	18	15	14
Next 32 kw.-hrs. each mo. ..	4.5¢	....	....
Next 35 kw.-hrs. each mo. ..	....	5.5¢	....
Next 36 kw.-hrs. each mo. ..	....	....	5.5¢
Next 100 kw.-hrs. each mo. ..	2.25¢	2.5¢	3.0¢
Over 150 kw.-hrs. each mo. ..	1.75¢	2.0¢	2.0¢

any customer violates the established rules and regulations, the service can be discontinued. Service can be stopped when a customer steals electric current, or when theft devices are found on the customer's premises. Since the service connections, transformers, meters, and other equipment for a customer have a limited capacity, the customer cannot increase his purchases beyond this capacity unless the distributor approves larger purchases. Using service for no more than thirty days, a consumer can be required to pay connection and disconnection charges. Likewise, if a buyer wants a nonstandard service such as voltage alterations, he must pay the special costs of the service. And the TVA forbids a city or cooperative to sell electricity for submetering or further resale.

Accounting and Financial Controls. Small municipal plants commonly have poor accounting systems, haphazard accounting or no accounting at all for plant depreciation, and no consistent plan for the disposition of funds. To avoid these defects, the TVA prescribes systems of accounts for the public and cooperative distributors. A municipality also must keep the funds and accounts of its electric operations separate from other municipal funds and accounts. And if a municipality in the Tennessee Valley operates both urban and rural electric systems, it is required to segregate the accounts and funds of the two systems. The TVA wants to be sure that the prices of farm and city services can be determined separately, that the losses of one service cannot be shifted to the other customers.* Finally, the public and cooperative distributors are expected to furnish operating and financial statements whenever the TVA requests them, or to pay the costs that the Authority incurs as it assembles the special reports.

In the standard contract a municipality or cooperative agrees to dispose of its gross revenues in a certain manner. First, the revenue of a public distribution system shall be used to pay current operating expenses—the wages, materials, and wholesale costs of power. Next, available revenue is used to pay interest and to meet sinking-fund provisions (or amortization charges) on indebtedness. After these costs are paid, "reasonable" reserves are set up for plant replacements, new construction, contingencies, and a sensible amount of cash working capital. Then a city may pay itself a return on the plant investment that is described in the next section. Thereafter a municipality can take some electric revenue in lieu of taxes, though the city can obtain (as described later) only a certain amount of the revenue. Finally, if any revenue remains after these deductions are made, it can be used to reduce the surcharges and rates for customers.

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* To give a cost advantage to rural service, the TVA specifies in several contracts that the costs of rural service (including power costs) shall be the increment beyond urban service costs. First the urban costs are measured as though the rural system is not in existence; then the costs of rural service are the remainder of the total costs.[18]

Following these rules for cash revenue disbursements, a distribution system must amortize indebtedness and create a replacement reserve before the customers can obtain rate reductions. One deduction, the amortization charge, is used to liquidate the existing indebtedness; the other, the provision for a replacement reserve, accounts for the plant depreciation and provides funds for future replacements of the existing plant. If the revenue of the city or cooperative system is always high enough to cover both deductions, the same cost of electric service is counted twice. Although the accounting methodology is different for the two deductions and though one deduction is designed to liquidate indebtedness while the other accounts for depreciation and may accumulate funds for reinvestments, the customers still are charged twice for the same cost of service. They pay twice for the use of fixed plant: once when the debt is amortized, and again when the replacement reserve is accumulated. By the time a successful distribution system is ready to make plant replacements, it has paid off its debts and has accumulated earmarked or unearmarked funds for the purchase of plant replacements. The first generation of consumers pay higher rates, consequently, than are paid by later generations so that the system can be free of debts. The first generation of consumers foregoes price reductions so that the distribution systems can make reinvestments out of their own funds, and do not need voter approval of bond issues. Copying the conservative financial policy of some municipal electric systems, the TVA tries to free the public distribution systems from local political controls of reinvestment decisions.

Earnings Control. As the rules for revenue disbursements indicate, the TVA regulates the earnings and limits the price changes of its public distributors. But the necessary uses of cash—operating expenses, interest charges, sinking-fund payments, reasonable reserves for plant replacements and working capital—do not make up all reasonable costs of public service. Two other costs are supposed to be covered by customer revenue; otherwise the standard price schedules can be increased. One of these is connected with plant that was in operation before TVA service began. Owning such an electric system, a city uses electric revenue to amortize the electric plant indebtedness and to pay interest charges on the plant debt. Furthermore, the city is allowed a 6 per cent return on the "municipal" investment, the difference between the present value of the electric plant and the electric plant indebtedness. The TVA and the city agree on the present value of the established electric system. But when the city owns a generating plant, the TVA does not include the plant in the present property valuation unless it is needed for more than stand-by service.

Payments in lieu of taxes are other costs of public electric service. The TVA fixes the maximum payments that a municipal electric system can make to a city government. Receiving money in lieu of taxes, the city is entitled to the property-tax rate of the city times the electric system value that is located within the municipal limits. In addition the equivalent of state and county property taxes can be collected on the same property, unless the state and counties already are collecting these taxes. And the TVA has a standard schedule of street-lighting rates at which electricity must be bought for municipal purposes. When the TVA controls the fiscal relations of the municipal electric systems and the local governments, municipalities cannot take free service (or underpriced service) and draw cash contributions as they please.

SOCIAL CHARACTERISTICS OF PRICING

Several pricing practices of the TVA and other multiple-purpose projects stand out. Guiding the greatest public-ownership movement in American history, these regional enterprises do more than show a preference for public distributors. They actively promote the expansion of public and cooperative distribution systems, and act as regulators of the distributors. Trying to realize a wide geographic distribution of their electricity, these projects fix uniform prices for a region rather than prices which are differentiated according to transmission distances. Although they respect the Congressional objective of self-liquidating investments, they are willing to take chances on low initial prices. And even if they use discriminatory pricing, they do not practice it so freely as private companies do. Yet, in spite of the social purposes that are expressed in some of their pricing practices, the regional projects do not adjust electricity prices to business-cycle conditions. Prices are chosen for an indefinite time; the price schedules are no more dynamic than the price schedules of private companies.

Responsibility for Distributors. When the TVA controls accounting, financial practices, and service standards for the public buyers of its electricity, a new form of public utility regulation is established. If the traditional form of control of municipal systems is followed, then the city government or, as in Wisconsin, a state commission prescribes the accounting systems, service standards, the electricity prices, and transfers of electric-system funds to general municipal funds. The TVA regulations are superior to these traditional controls of municipal utility systems. The governments of many small towns and some large cities are unable to make intelligent choices of prices, accounting systems, uses of electric-system earnings, and other matters. Many municipalities are so anxious to sell electricity at low prices that they disregard the earnings effects of the chosen prices; others have only fragmentary systems of accounts, or do not maintain a separate system of electric plant accounts; and some cities use the electricity earnings to reduce taxes instead of electric rates. If they possess authority to regulate municipal utility systems, the state commissions can restrict the political management of utility services. But state commissions rarely accomplish as much as they are authorized to achieve. And because the work of state commissions usually is confined to private company problems, they commonly are not well experienced for municipal plant regulation.

A regional power organization, such as the TVA, can perceive the need for public-distributor regulation, establish standard terms of control throughout a region, and use its contractual powers to enforce the regulation of municipal and cooperative systems. Unlike the local governments and state commissions, the public power organizations can comprehend the composite nature of the pricing, service, and financial problems of public distributors. Moreover, such an organization can effect continuous regulation with its contractual powers, whereas a state commission usually regulates in the familiar case-by-case manner. More important, a regional power organization cannot carry out its public-ownership program unless it can integrate all phases of the program—the distribution as well as the production of electricity, the retail prices as well as the wholesale prices. A public power program does not end with the production and transmission of electricity; it extends to the consumer of electricity, and embraces a continuous stream of public service. Performance of public service is the important issue; the rights of local governments are secondary considerations. At any rate, the economies of public electric service can be dissipated when cities and cooperatives are allowed to divert electric service funds, to choose any kind of retail prices, and to be as careless as they please with electric service accounting.

Regional Uniformity of Prices. Disregarding the increments in transmission costs as the distance of transmission increases, the TVA and some other regional projects choose uniform wholesale prices. Even if they have different locations, all cities and cooperatives buy electricity at the same wholesale prices from these projects. Likewise, the large industrial buyers are charged the same or approximately the same prices whether they are a few miles or several hundred miles from the nearest generating plant. Some persons, who are steeped in private-business thinking, cannot believe that postage stamp pricing, as they like to call it, is preferable to price differentiation. As they reason about pricing problems, cost is a "sound" basis of price control; measurable differences in service costs should lead, therefore, to price differentiation. Local groups want low prices because they are near the generating plants; they want the price advantages that are commensurate with their locations. For instance, the civic interests of Portland, Oregon, asked for zone pricing of Bonneville electricity, because they wanted a large share of the new industrial firms that could be attracted by the low electric prices.

Regional uniformity of prices is consistent with the social purpose of regional power production. Multiple-purpose projects are built to serve the inhabitants of a whole region. The water basin is the planning and service area. In the case of the TVA, for example, the water resources of a whole valley are developed according to a regional plan, not according to a series of unrelated local plans. Dams on the Tennessee River, all of which are run-of-the-river dams, are located in such a way that a nine-foot navigation channel is possible. And the storage dams, such as Norris Dam, are located where they can hold the runoff of water most effectively during the rainy seasons. Regional projects produce flood control, irrigation, navigation, and electric services for a whole region, not for separable parts of an area. Likewise, the cost of electricity production and transmission is incurred for the regional mass of consumers. Since the enterprises are developed for all electricity consumers of the regions, the administrators have a good reason for uniform charges to all distribution systems. Contrasted with differentiated prices, uniform wholesale prices distribute the public production economies evenly over the whole region.

Low Initial Prices. One new characteristic of public pricing, the introduction of remarkably low wholesale and resale prices, received more public attention than all the other characteristics. Just as soon as the TVA and most other regional projects commenced to operate, they offered electricity to wholesale and retail buyers at prices far below those of most private companies. Unlike the private firms, the public power producers did not expect the consumers to "earn" the price reductions. Electric companies commonly withheld price reductions until they could anticipate immediate increments in earnings from the reductions. Or they withheld price reductions until their earnings were above reasonable levels—until the commissions could order price reductions. The courts condoned this practice; and the commissions were willing to accept it.

The administrators of the regional projects did not adopt the conservative private controls of price reductions. Nor were they convinced that the demand for electricity was inelastic at all possible prices. These administrators, particularly the TVA directors, saw a chance to obtain increases in total revenue as the prices were reduced. And they were willing to take the chance. They were willing, moreover, to put price reductions to a fair test. Large price reductions—those large enough to be noteworthy and to attract the attention of consumers—were chosen instead of a succession of small reductions. Larger buyer expenditures for electricity were not expected in the first month or year of service; the full response of buyers to the price reduction was not expected for five or more years. In the case of TVA service, which afforded the best test of this pricing policy, buyer expenditures for electricity increased after the second year of service.[19] When the TVA began to operate, an ultimate consumption of 1,200 kilowatt-hours a year was expected for the average residential consumer. But after the buyers' response to the price reductions became known and the average consumption of electricity was nearly 2,000 kilowatt-hours, some TVA men thought that the average residential buyer eventually might consume 2,500 kilowatt-hours a year.[20] Experimental pricing marked out new limits of electricity consumption. The success of these experiments was an inducement not only for future price experimentation by public projects, but also for a revision of the nonexperimental regulation that state commissions commonly used.

Discriminatory Pricing. The rate schedules for the regional power organizations show evidence of discriminatory pricing. Like the private company managers, the public administrators differentiate their prices according to differences in the buyers' demand prices. The quantity-discount type of price discrimination is freely used; the prices of the block schedule are scaled according to the buyers' demand curves. And the public projects also discriminate somewhat between different classes of buyers. But the public undertakings do not carry the class pricing so far as the private companies do. Wholesale prices are approximately the same for public, industrial, and electric company buyers. Except for one special schedule for public buyers who have low load factors, the Bonneville project uses the same rate schedules for all kinds of buyers. Some industrial buyers purchase TVA electricity at the standard wholesale schedule of prices, though a few contracts require the payment of slightly higher prices (even if a high load factor is assumed) than the cities and municipalities pay. The uniform or nearly uniform prices favor the public buyers more than the industrial firms. The TVA directors even admit that they are willing to charge the industrial buyers as much as these buyers are willing to pay. As David Lilienthal, former director and notable leader of TVA, once said, "We are interested distinctly . . . in charging as high as the traffic will bear to the industrials."[21] No similar attitude of exploitive pricing is expressed toward the public buyers.

The regional power organizations, led by the TVA, do not wish to create many classes of retail buyers. Municipal and cooperative systems have only a few customer classifications; they have only the commonest classifications of private electric service. TVA distributors have four standard rate schedules: residential, small light and power, large light and power, and street lighting. Differences in elasticity of demand, the basis of class-price discrimination, do not fully explain the price differentials between the four classes of service. When the class rate schedules were chosen, TVA officials did not study the elasticities of demand. Nor were the price differentials clearly based on the actual costs of service. They were based apparently on the judgments of TVA engineers and advisers; judgments were made on what set of standard price schedules assured a financial success for most of the distributors, and on what differentials seemed to serve the interests of the consumers.

Discriminatory pricing is obvious in the block rate schedules. A block-price schedule for a public system, like the block schedules of private companies, is price differentiation according to buyers' demand prices. Since demand serves as the basis of price differentiation, a block schedule represents a kind of discriminatory pricing.* Even if the managers of a public electric system do not carefully study the buyer-demand curves before the block prices are chosen, the block schedule still is a discriminatory form of pricing. Given the schedule of prices, buyers vary their purchases according to the differences in their demands. If a residential consumer of TVA electricity is willing to consume only 40 kilowatt-hours each month at a price of 3 cents a kilowatt-hour, he pays a uniform price of 3 cents a kilowatt-hour. Yet if he has enough income and appliances to buy more than 50 kilowatt-hours each month, his demand and income are large enough so that he buys part of his electricity for 2 cents a kilowatt-hour. Even in the Tennessee Valley the electricity cost for lighting, small appliance, and refrigeration uses is higher than for cooking and water-heating uses. Even in the Tennessee Valley the buyer who cannot afford expensive appliances is required to pay a higher average price than the one who can.

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* The directors and rate engineers of public projects, like those of private companies, apparently fail to understand that a block rate schedule is a discriminatory schedule. Thinking about output enlargements, they praise "promotional" rate schedules.

Although the regional projects practice discriminatory pricing, they are more respectful of the small- and low-income buyers than most of the private companies. When the TVA prices were chosen, one of the rate engineers said that "even small customers should be given a chance to buy some low-cost power. . . ."[22] Municipal plants and rural cooperatives are not allowed to collect service charges. The small customer, who uses electricity principally to light his home or small shop, pays a top price of 3 cents a kilowatt-hour. And when the standard residential rate is reduced in the TVA territory, the small buyers get the largest rate reductions. Any criticism of the discriminatory pricing should be tempered, too, by another fact: quantity-discount pricing is a means of enlarging the consumption of electricity. If the public objective is utilization of the available plant capacity, a block schedule of prices is a better choice than a uniform price. Having large amounts of unused plant capacity and wishing to achieve the "widest possible use" of electricity, the regional projects have good reasons for the use of block rate schedules. This form of discriminatory pricing can be used, as the experience of private electric companies demonstrates, to enlarge earnings too. But public systems apparently direct the use of discriminatory pricing more to the enlargement of electricity consumption than to an expansion of earnings.

A discriminatory price schedule gives more production economies to large buyers than to small buyers. If the public authority wants to take advantage of the differences in buyers' demands, a block schedule or some other quantity-discount schedule is a good choice. But the social purpose of electric operations can be served, too, by giving price reductions to the buyers who have the lowest demands, and who cannot afford to buy large quantities of electricity. Families with small incomes, owners of small stores and shops, and small and possibly struggling manufacturers can benefit from price reductions, even if they do not buy more electricity. Projects are not built to give wealthy residential consumers, who can afford to buy large homes and many appliances, more price benefits than to the consumers who always dwell in small homes and never can buy more than a few electric appliances. Surely electric service is developed for the regional mass of consumers. If it is, the first block prices of a rate schedule should be reduced when the earnings of municipal and cooperative systems are large enough to allow price reductions. After a market is developed and the unused capacity of existing plants is utilized, a regional system should move toward uniform prices instead of more promotional (discriminatory) pricing.

Cyclical Variation of Prices. The prices of regional-project electricity do not fluctuate with cyclical changes in other prices, regional income, and employment of laborers or other resources. The contracts between the TVA and public distributors have one provision for cyclical adjustment of prices. Revision of the wholesale rate schedule is considered after the cost of living, measured by the cost-of-living index of the Bureau of Labor Statistics, increases or decreases as much as 30 per cent above or below living costs at the time the contract was signed.* When the national cost of living changes more than 30 per cent, the TVA and public distributors confer about revisions of the wholesale price schedule.[23] The price adjustments are based on changes in the electric production costs. These adjustments concern the wholesale rate schedule alone. And nothing at all is said about cyclical adjustments of the retail electric prices.

Just as the TVA and other regional power organizations successfully experimented with low initial prices, so they had an opportunity to develop a dynamic pattern of electricity pricing.[24] If the managers of the public projects wanted to change their prices as consumer incomes changed, legal conditions did not prevent adjustments.† These systems were not bound, of course, by traditional regulatory views that limited the state commissions to current, year-by-year measurements of reasonable earnings. Both the regional suppliers and public distributors were free to take a cyclical view of their revenue needs, and to collect the largest amounts during recovery and prosperity years. A year-by-year measure of reasonable public earnings was more convenient, of course, than a cyclical measure of reasonable prices and revenue. If the public managers were willing to accept some administrative inconveniences and were willing to educate the buyers to a dynamic rather than a static price policy, the business cycle could be the time period for reasonable revenue measurements and investment amortization. Yet the project administrators did not set up rate schedules that were adjustable to cyclical changes in buyers' incomes and demands. They made an easier choice; they followed a conventional and nondynamic pattern of pricing. Even though the projects were built for social instead of private purposes, the directors failed to explore a possible social dimension of electricity pricing.

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* In the first contracts the price adjustments were considered after the cost of living increased or decreased 20 per cent instead of 30 per cent.

† Cyclical variations of public utility prices, including two possible plans for the variations, are discussed in Chap. 19.

Chapter 35

A Slow and Fitful Growth

PUBLIC UTILITY regulation, presenting special problems of price, service, and financial control of private companies, is a distinctive case of social action. To be socially effective and just, the regulation is controlled by reliable information, competent regulators, and wise judicial decisions; the social effects of regulatory alternatives are studied; and the regulatory action is directed toward good and attainable ends. Organizing regulatory experiences, using the best knowledge, and exercising enlightened judgment, public authorities can set up a rational pattern of regulatory means and ends. They have a public responsibility, indeed, for this accomplishment. Yet well-reasoned, socially effective regulation is not realized at once. This regulation is in the hands of more than one public official: it is authorized by the legislatures, administered by the commissioners, and limited by the courts. Respecting the tradition of free private enterprise, the legislatures often do not authorize more regulation until the populace, emotionally aroused by questionable utility-company conduct, demands more severe controls. Some regulators do not have enough knowledge, they fail to reason carefully about regulatory procedures and objectives, or they do not make the most of their statutory powers. And the courts sometimes sharply limit the regulatory authority. A reasoned, intelligent regulation unfolds slowly in a democratic society. The prevailing regulation often seems to fall far short of the controls that society ought to have.

When utility industries began to develop during the nineteenth century, the people relied on private companies for most utility services. And this reliance on private firms continued through the nineteenth and twentieth centuries. American people accepted private production of utility services, even though they usually disliked impersonal companies and distrusted the motives of large corporations. Consumers often grumbled about the acquisitive, nonsocial practices of the companies; yet they tolerated private production. Before the First World War the American cities commonly did not build utility plants unless private investors were unwilling to finance the plants. The private firms could satisfy the consumer demands that increased enormously as the cities grew and technical improvements were discovered. Possessing extensive technical knowledge and financial resources, expanding rapidly, extending service to new urban areas and sometimes to rural areas, the private utility firms provided the services that the people wanted. The technical efficiency of the utility companies pleased the consumers, and seemed to compensate for some social deficiencies of the services.

Although the people accepted private production of utility services, they demanded regulation of the producers. The economic power of the private companies was curbed. Yet the control did not always have rational guidance. Ever since utility regulation began nearly a century ago, the feelings of the populace, expressed through democratic government, were the main guiding force. Legislators, regulators, and even judges yielded now and then to the strong feelings that consumers had about utility companies. Conditioned by public feelings (expressed in newspapers, individual contacts with politicians, organized lobbying of reform groups, and votes), regulatory legislation was passed when the populace, driven to open anger by many grievances, demanded action. While the consumers usually did not like the business practices of the utility firms, they often tolerated their price, service, and financial policies for many years. But the discontent accumulated, and finally was expressed in vindictive legislation or more aggressive, uncompromising administration of regulation. Then the consumers, expecting effective control, became apathetic again; and before stronger action was taken against the companies, the feelings of the populace usually had to be aroused anew.

Railroad regulation, the first important break in the private-enterprise tradition, was an example of the way in which democratic governments struggled slowly to achieve wise and extensive controls. Led by the Patrons of Husbandry (the Grange), Midwestern farmers, disliking Eastern promoters and blaming railroads for low farm incomes, demanded state regulation of railroads. State commissions were created throughout the country. Because the state commissions did not live up to their promises and could not regulate interstate railway transportation, the Interstate Commerce Commission was created in 1887. Yet for many years the ICC lacked statutory controls of railway earnings and prices. Amending the original law now and then, Congress slowly broadened the scope of federal railway legislation. The ICC did not have a broad statutory base for regulation until the Transportation Act of 1920 was passed. And by 1920 the railway industry was mature; abandonments of railway lines were already more common, indeed, than the construction of new lines.

The limits of other utility regulation, too, were slowly and experimentally extended. Local control of water, gas, street railway, telephone, and electric companies became common after the Civil War. But franchises proved a poor means of regulation; local government officials usually were incompetent regulators, some cities freely used utility revenue to reduce taxes rather than to reduce consumer prices, and some utility firms, as in the telephone and electric industries, outgrew the local limits of plant operations. Local control of utility companies failed; after 1900 the regulation, except for the railroad industry, passed over to state commissions. These commissions did better work than the local governments. Yet most of them, except for a few organizations like the Wisconsin and California Commissions, were not aggressive, consistent regulators. And state legislatures often forgot about the utility controls, failing to broaden the powers of commissions or to appropriate abundant funds for investigative and supervisory work. State regulation barely moved forward between the First World War and 1933. Then the commissions and legislatures, goaded by depression conditions during the thirties, tried to improve the public control. That sluggish, groping struggle toward indefinite regulatory objectives still continues.

Public utility control develops in a piecemeal manner. Lacking a thoroughly rational basis of action, it often does not proceed in a steady, intelligent manner toward fairly definite, wisely chosen objectives. Legislatures do not give commissions unlimited authority; commissioners are not always well trained, experienced men; funds for regulatory activities (particularly among the state commissions) often are too limited for frequent, effective control of companies; and commissions often concentrate on some methodology of regulation, neglecting or failing to understand the primary purposes of their work. Some particular deficiencies are obvious. Legislatures do not delegate control of all utility industries, financial transactions, service problems, or pricing situations. And commissions often do not fully use all the powers that legislatures delegate to them. Companies are not subjected to earnings investigations every year or two; expenditures are not studied so that some standard of managerial efficiency can be fixed; differential price structures are perpetuated; and security issues, property acquisitions, and dividends are not always regulated carefully.

Some regulatory deficiencies are more subtle, and are not easily identified or corrected. These defects are associated more with the general purposes than with the methods of public control. One general defect is the failure to tie up earnings and price regulation with private investments. Neither the federal nor state commissioners seem to ask themselves what the earnings expectations of private companies are, how earnings regulation can affect present and future investments in utility plants, and what service-investment relations are desirable. Regulators are not always clearly aware that they, like the company managers, must work with the conventional rules of capitalistic business; the capitalistic rules may not be so attractive socially as they once were, but we still have them. Most commissions apparently are satisfied with mechanical controls of earnings. They often compute simple rates of returns on simple property valuations. Consequently the earnings regulation is not clearly or directly related to service standards, service expansion, plant abandonments, and technological improvements.

While commission control proceeds experimentally and haltingly toward unclear objectives, the list of utility industries is quite firmly fixed. Utility regulation is not extended to new industries. Today, as in 1900, control is applied primarily to railway, urban transportation, water, telephone, gas, and electric companies. Here and there the Supreme Court approves earnings and price regulation for industries that are not on the common list of public utilities. During the thirties the Court approved regulation of milk and coal prices. And a farm price and production program, which was designed to increase farm income, became a permanent part of federal government. But these new kinds of price control do not follow the customary pattern of utility regulation; they are designed to benefit producers instead of consumers. There is, in fact, no clear prospect that utility control will be extended to many new industries. The Supreme Court, protecting private property and accepting the tradition of private enterprise, has a narrow concept of a public utility. It approves more utility regulation only when private practices clearly are intolerable. Nor do consumers determinedly demand much more commodity price regulation. Nowadays the pressure for new price regulation comes more often from producer interests, particularly the farmers and small businessmen, than from consumers.

Contemplating possible improvements of public utility regulation, a student must consider some basic conditions of regulatory changes. No condition is so fundamental as the general democratic process of government. Moving slowly toward uncertain or even unknown objectives, our democratic government does not establish rational regulatory patterns as soon as some studious observers show the need for them. The process of democratic change not only is slow and incomplete, but also the governmental authority is divided. Faithful to the idea of "checks and balances," our government is comprised of three fields of action: the legislature, the administrative agency, and the judiciary. And before governmental changes can be effected, all three branches of government must act. Public utility control is a joint product of legislative, administrative, and judicial action; a legislature delegates powers and funds to a commission, the commissioners show needs for more legislative action as they use the available powers and funds, and the courts limit both the legislative and administrative authority.

The success of commission regulation depends, in part, on legislative action. State legislatures and Congress fix the general conditions and standards of public utility control. They determine the authority of commissions. And they control the appropriations of funds; they determine the resources of commissions, limiting thereby the intensity and efficiency of regulatory work. Legislators rarely are experts in utility controls; they absorb so few of the American experiences with public utility regulation that they do not seem to know more on these matters than the legislators of the earliest regulatory periods. State legislatures, meeting once every year or every two years for brief sessions, give occasional attention to regulatory improvements. Even Congress, getting more expert advice and being generally more alert to legislative needs than the state legislators, does not undertake general improvements of public utility control in every session; the federal legislation, like the revisions of state statutes, usually comes in spurts. Pressed by an indignant populace, both federal and state lawmakers suddenly take a large interest in utility companies; then they turn back to many other problems, and for many years appear more indifferent than attentive to public utility control.

Despite the sluggish and sporadic movement, the general direction of public utility legislation is toward more control of financial and managerial interests. Private firms cannot hope for more than long delays of regulatory legislation; even conservative governments, liking private business and staying further restrictions of private management, are not likely to be so reactionary that they delete some significant controls. At least the regulatory history shows clearly a growth of regulatory legislation—a slow and fitful growth but an indisputable one just the same. The next large addition to commission powers may be put off until our economic system drops into another deep depression, until the whole capitalistic framework as well as the private utility industries show convincingly the need for vigorous public action. More controls of utility companies are coming. There are many important gaps in the powers of state commissions that need to be filled if the regulation is to become effective in many states. And Congress is certain to look toward regulatory solutions of new problems as well as more effective solutions of old problems; this probably means further ascendency of federal commissions and a slowly declining importance of state commissions. Consumers can expect more protection against the acquisitiveness and authority of private companies, but they must wait.

The courts also limit the alterations of public utility controls. Here and there the courts yield to legislative judgments and administrative expertness, allowing legislatures and commissions to proceed with regulatory patterns. But the courts stand ready to protect the property rights of private companies—to balance the conflicting interests of utility consumers and utility firms. The Supreme Court, the supreme legal authority of the country, is not yet ready to return to the judicial review standard of the Munn case, giving legislatures and commissions complete control of the companies. It is not ready to say, as it did in the Munn case, that "for protection against abuses by legislatures the people must resort to the polls, not to the courts." The Court apparently is unwilling to relinquish its responsibilities and its power. Aggressive control and regulatory innovations, consequently, are subject to judicial review. Deciding individual cases, the Court slowly outlines the legal limits of regulatory action. In the future as in the past judicial review is quite certain to be available to utility companies that want to test the commission decisions, and want to delay earnings, financial or service changes with court litigation.

Even though legislatures and courts restrict the intensity and scope of regulatory activity, most commissions can blame themselves for much of the ineffective control. Deficiencies of regulation are most noticeable among the state commissions. Practicing the practical art of politics, the state commissioners are conservative administrators; they rely on hard facts and old methods of control. These men have a part in democratic government, but they commonly are not spirited leaders who have a deep understanding of democracy. Regulation of utility companies obviously is their business; but they seem usually to manage the control in a clerical and opportunistic manner, and do not show much interest in new ideas and reflective thinking. Even the best commissions, controlled by men who want convenient and factual methods of control and who keep their eyes on the main political chances, fall short of excellent democratic government. Yet, even if allowances are made for political and human fallibilities, only a few state commissions have respectable regulatory records. The weak commissions seem to be most common. Some state regulators, lacking knowledge of regulatory methods and purposes, do not know how to use available powers, fail to hire expert staff members, and do not always comprehend or scrutinize the pricing, financial, accounting, and service practices of the companies. These commissions also lack funds with which aggressive, intelligent regulation can be effected. Although defective public control has been evident for many years in many states, many of the defects never have been corrected. Apparently infrequent and incomplete regulation will persist for many more years.

To correct some defects of regulatory action, consumers can demand federal rather than state control. Blanketing the country with public controls, federal commissions can standardize regulatory policies and equalize the effects of regulation between states and regions. Having large appropriations, federal commissions can hire expert employees and large staffs. These commissions can realize some large-scale economies of control that are not available to the state commissions. Yet, even though the Securities and Exchange Commission provides extensive control of financial transactions and the Federal Power Commission is a source of nation-wide accounting, earnings, and price regulation, states are not willing to yield their utility regulation to the federal government. Apprehensive about the growing scope of federal political powers, state governments jealously protect their authority, while many voters, too, follow the democratic tradition of decentralized government, preferring local or state control rather than regulation from distant Washington.

While an official substitution of federal authority for state control is not yet in sight, the expansion and greater efficiency of federal commissions are reasonable predictions. New problems, growing out of new technology or broader social views of government, often call for national rather than local action. Supervision of radio broadcasting toward the ends of better programs, less advertising and wider geographic distribution of service, integration of generating and transmission equipment as the interstate movement of electricity expands, production and selling restrictions that economize the natural gas resources of the nation, further limitations of the managerial authority of the AT&T system—these are a few problems for which federal solutions are needed and may be obtained. At the same time the federal regulation will deal with more of the old-type problems such as accounting control, security issues, corporate consolidations, reasonable earnings, and price structures. Increasing amounts of federal control will be substituted for state control just because the federal commissions have more extensive authority, better staffs, and more aggressiveness—just because they overshadow most of the state commissions. A slow retrogression of state regulation seems to be ahead; a few state commissions will remain strong and active, but many others, particularly in the agricultural states, will show more and more evidence of moribundity while their members still complain against the loss of state rights.

Using skilled and nonpolitical commissioners, the states can avoid large concessions to federal authority or at least slow down the rate of their retrogression. If intelligent, extensive regulation is the main objective, then technical qualifications can be specified for commissioners. The qualifications of a commissioner can include some sizable minimum knowledge of regulatory problems. But political considerations generally overweigh regulatory skills. When a governor appoints a commissioner, he commonly considers the general political records of possible appointees, trying to find a man who can serve the interests of the party. And voters, relying on the good judgments of common men, do not demand expert regulators. Voters, in fact, generally are distrustful of experts. Judged by their past records, governments are satisfied with commissioners who rarely hold office long enough to become skilled. The standard of utility regulation is scaled down, consequently, to the limited competence of the commissioners.

Compensating for their own shortcomings and following the practice of federal commissions, state commissioners can hire expert staff members. Yet, even if state legislatures take more interest in utility regulation and provide more funds for regulatory activity, state commissions often are not interested in employees who can contribute new ideas. Apart from political appointments, they hire men who can provide some mechanical skills. Accountants and engineers gather and arrange facts that are useful means of regulation. And lawyers are used mainly to handle hearings and investigations or to prosecute cases. Commissions usually do not hire lawyers, government students, and economists who are able to reshape the regulatory pattern. A regulatory elite cannot develop easily in this country. Lacking training and experience themselves and considering the political dangers of frequent regulatory innovations, commissioners do not want many of the ideas of expert men. They distrust men who talk about new regulatory purposes, and who speak fluently in a strange, authoritative manner. Politics are respected, experiences are relied on, and ordinary men are trusted. Meanwhile the federal commissions hire skilled employees, take some of their advice, and show distinctly more regulatory accomplishments than are shown by the state commissions.

When either state or federal commissions hire large staffs and some expert employees, another kind of defect can develop. The regulatory process can be frozen into an administrative routine. A commission and its staff can become habituated to a fixed procedure; all earnings, price, financial, and other decisions are fitted to standard patterns. There are many characteristics of regulatory inertia: standard forms are used to compile information, companies commonly are treated alike, and uniform accounting procedures are used everywhere. Any regulatory organization, particularly a large federal or state commission, is bound to settle down to standard procedures, to become accustomed to methods that cannot be changed unless people are upset, and to put more emphasis on the methodologies than the objectives of control. A state of order, whereby organizational friction is minimized, is dear to a dutiful administrator. Utility commissions, like other organizations, acquire a "trained incapacity": readjustments are bothersome. Frequent reorganizations of commissions are desirable, but cautious or contented administrators usually avoid the turmoil of organizational shake-ups. As federal regulation loses some of its present expansive temper, it can become even more routinized than state regulation simply because the federal commissions are larger.

The history of public utility regulation reveals a long struggle to find an objective standard of earnings and price control. When the state legislatures and Congress enacted regulation of utility companies, they gave up an objective form of earnings and price determination. They gave up market-place prices that were controlled by the consumer demand and the companies' costs—by monopolistic standards of pricing. Taking over authoritative control of earnings and prices, commissions commonly tried to avoid strictly subjective standards of control. Both the consumers and companies might request prices that were not objectively measured; each of the conflicting parties frequently asked for prices that pleased them. Consumers wanted lower prices; companies, trying to protect their existing earnings wanted the established prices or higher prices. To settle the buyer-seller controversies, commissions relied on a practical cost standard of reasonable earnings and prices. The reasonable costs of service were the operating expenses (which most commissions did not examine carefully), the depreciation cost of useful property, and a reasonable investor return on the useful property.

For a long time the earnings regulation was restricted by the Supreme Court. Not only the companies, consumers, and commissions had standards of earnings control, but also the Supreme Court had a standard. And the bench mark of the Court was the most authoritative one. The Smyth rule, a fair return on an uncertain combination of original-cost and reproduction-cost valuations of useful property, was used for many years. This confusing standard allowed the companies to twist facts, and to defend their existing earnings by appealing to the courts. Court litigation of earnings regulation was a constant threat to the commissions. Then, after 1942 and after consumers and commissions made strong protests for many years, the Supreme Court relaxed and later abandoned the Smyth rule. And the commissions were given larger opportunities for discretionary regulation of earnings and prices. Now the commissions are free from close judicial review; now they finally can develop their own methodologies of earnings control. But the Court apparently still stands ready to prevent acquisitive regulation—to prevent the use of methods that do not lead to reasonable consequences. As long as democratic government and individual freedom are real and as long as judicial review remains as a public protection against unlimited administration, the Supreme Court is not likely to abandon completely an interest in both the methods and results of public utility regulation.

After judicial review was relaxed, commissions began to turn earnings regulation into an expedient accounting process. Operating expenses were compiled from accounting records, depreciation costs were measured by the depreciation accounting charges, and the investor return was figured on the investment costs or "first" original costs of properties that were listed in the plant accounts. Special accounting plans, such as the Washington and New Jersey Plans, sometimes were devised for earnings control. This accounting process was the work of commissioners who used known, historical facts to measure the unknown, future conditions of private company operations. Subtle, long-period connections between earnings regulation and private utility investments were disregarded. And earnings regulation, which seemed to be directed toward practical administrative ends rather than future investment and service conditions, became a special case of "trained incapacity." The maturing control of earnings often was an expedient rather than an intelligent, foresighted regulation. Future regulators will be compelled to watch themselves as well as the companies if they mean to be wise and reasonable; interested in good regulatory effects, they will avoid administrative ruts—avoid oversimplifications of regulatory procedures and a disinterest in the social consequences of regulation—while they also try to curb the managerial behavior.

Service policies and price structures gradually were shaped by the utility-company managers. These managers, controlling the investment decisions, chose the new markets in which service expansion took place. In the future, too, commissions probably will be satisfied with private control of new market developments. But the commissions take a different view toward abandonments, forcing companies to maintain service in unprofitable areas even after the companies earn less than reasonable total returns. After utility firms mature and begin to suffer demand decreases as frequently as they experience demand increases, the abandonment problem will become more significant. When technical maturity and demand decreases are common experiences of utility companies, commissions may be forced to relate service abandonments to the whole earnings problem.

Accepting the pricing policies of utility companies, commissions heretofore have allowed the development of discriminatory price structures. Consumers were divided into classes to which the companies charged different prices. And further price differentiation was effected according to the quantity of buyer purchases. Commissions do not try to prevent or to erase price discrimination. Why? Some regulators do not understand what price discrimination is. Others like some kinds of price differentiation; these differentiations often are cases of what they approvingly call "promotional" pricing. More price discrimination can be expected, unless the commissions begin to study the economic nature of price differentiations and temper their interests in promotional price schedules. Even if the regulators can distinguish between discriminatory and nondiscriminatory prices, they still hesitate to eliminate the discriminatory rates. To create nondiscriminatory price structures, commissions must increase the prices to buyers who now pay low prices. General revisions of price structures obviously cause trouble that the commissions do not enjoy and usually want to avoid. Shunning general alterations of the private price structures, the commissions do not work toward nondiscriminatory pricing, effect price reductions for the low-income buyers, and try to achieve a more nearly uniform consumption between the buyers.

For a long time most commissions neglected financial problems. Security issues, mergers, consolidations, and property or security acquisitions were handled by the companies. The expansion, size, total capitalization, bond-stock ratio, distribution of voting rights, and dividend policies of companies were largely private matters. When the utility firms were expanding, consolidating, and merging, the financiers (including the investment banking houses) were the most important managers. They controlled the expansion, security issues, and financial futures of the utility companies. Their most notable work was holding-company finance—the creation of pyramided corporate structures, exploitation of operating companies, and corporate control of scattered, disconnected properties. Organizing holding companies everywhere and limiting the public sales of voting stocks, these financiers acquired managerial control cheaply; paying high prices for properties and securities, they often built up overcapitalized corporate systems; acquiring voting securities and properties wherever they could obtain them, they frequently disregarded the technical economies of production; voting themselves large dividends from the operating and subholding companies, they bled the corporate systems and increased the chances of financial reorganization.

When economic activity collapsed in 1929 and the depredations of many financiers were revealed, a wave of financial controls rolled over the utility industries. Accounting systems were revised; state commissions improved their controls of operating-company securities, consolidations, and dividends; the SEC became a stringent regulator of finanical transactions in the gas and electric industries, and began to integrate and to reorganize the holding-company systems in these industries. Public authorities abandoned or modified the private standards of financing. These controls of financial matters are already fixed parts of our regulatory action; only the private managers and financiers, who do not get many listeners today, wish to abandon or temper them. Indeed, the success with this belated financial regulation is an inducement for more control. There are openings for additional financial regulation: security issues, consolidations, dividends, voting rights, and receiverships of many companies that are outside federal control, financing of radio stations and networks, and holding companies (particularly AT&T) in other than the gas and electric industries. More financial controls will be enacted by Congress and the state legislatures. The financier has less room to work in than he ordinarily enjoys; he is more a supplier of funds nowadays than a manipulator of public utility operations.

Some governments have produced utility service as long as private companies have. Municipal water and electric plants, which often were built because private companies did not want to build them, have been common for many decades. But municipal utility service, except for water service, has not always been an important part of the total utility service. Public electric service started to become more important, however, during the New Deal period of federal government. After 1933 when the federal government began to produce much electricity in its river-basin projects and to provide funds for other electric plants, public ownership of utility systems became a significant national policy. One part of the program is rural electrification; the Rural Electrification Administration plans and finances the lines that are not built by private companies. Using low-cost lines, the REA extends rural electric service beyond the economic limits that were fixed before 1935 by the private firms. At the present time the REA seeks self-liquidating projects. This requirement is certain to be modified in the future so that electricity can be extended to more farmers, even all the farmers who want it. Our government rarely differentiates between farmers, giving special benefits to only some of them and neglecting the remainder. As rural electrification is extended to more and more farmers, the REA lines reach into sparsely settled or low-income areas—into sections where less than two customers can be obtained for each mile of line and where the revenue is low relative to the investments. Financing these lines and satisfying the political requirement of indiscriminate electric service, the REA probably cannot hope to break even. Some of the rural electric service must be subsidized; otherwise a substantial number of the farmers are denied service. Subsidies seem to be a political necessity of the rural electrification program. Just as tax revenue is used to support farm income, so more tax revenue can be used to provide electric service for many rural families. Widespread consumption of utility service is beginning to replace the income standard of private business; the rural electrification program is a possible forerunner of what we may expect eventually for other kinds of utility services.

Municipal ownership of electric plants and rural electrification are parts of the public power program. But the main part of the program consists of multiple-purpose projects—large and numerous dams that control and utilize the water flows of whole valleys. Before 1930, when private firms produced nearly everything and the old liberalism was still strong enough to prevent public production and distribution of basic goods, the Ontario Hydro-Electric Power Commission was the most noteworthy public enterprise in North America. Only the most rabid protagonists of public ownership envisioned similar systems in this country. Yet, after the great depression of the thirties brought the New Dealers into political power, the federal government started an unparalleled public construction of power-producing projects. Boulder Dam, Columbia Basin improvements, the Central Valley project, TVA, and numerous lesser ventures can produce enormous amounts of electricity. They have a further distinction: planned as joint-purpose projects, they provide irrigation service, flood control, and sometimes navigation channels as well as electricity. This program of water-basin improvements is barely started; the people of many valleys await their dams, and the administrators of established projects have plans for more public investments. This may be the first step along a path to a nationalized electric industry. At least the program is a real challenge to private electric companies.

Our democratic government does not have a clear, thoroughly rational plan for public production of utility service. The new federal program is confined largely to electric service, and nothing is said about other utility services. Even the public production of all electricity is not a definite, ultimate objective: Congress approves individual projects, and apparently does not think (at least it doesn't think aloud) about nationalization of the electric industry. Public investments in power-producing projects are not guided exclusively by national interests. Rather, the regional business and governmental interests, seeking beneficial public improvements that are supported by all taxpayers, demand most of the water-basin improvements. And while Congress wants self-liquidating projects, it authorizes some undertakings that never can be liquidated out of the prospective revenue but can serve people and industries with low-priced and abundant electricity. In time Congress will have a more definite, national program for public electricity production; as Congress acquires more experiences it will be more capable of delineating policies, and as the program grows in physical scope and political importance Congress will be driven to establish more coherent managerial, investment, pricing, and service patterns. In the future congressmen can write out their public-ownership policies with more lucidity even if political considerations still limit clarity and rationality.

A democratic government cannot organize the public production and distribution of electric service or any other utility service so that it works in the foresighted, technical manner of an engineering program. This country is not Soviet Russia, and Congress is not the Politburo. Our pattern for public production does not take the form of a 5-year or 25-year plan; it is an experimental, uncertain, even at times an exasperating movement that is necessarily controlled in part by pressure groups and general political feelings. Consequently the federal electric program is not technically perfect; it does not have the efficiency of dispassionate planning. For instance, local and regional groups of persons, ranging from farmers who want irrigation service or flood control to civic and consumer interests who want low-priced electricity, can take advantage of a vote-sensitive Congress. The behavior of these groups, resembling the manner of the Farm Bloc or the Silver Bloc, is part of the inescapable environment in which public production develops in this country. And in depressions Congress decides to build more dams and reservoirs as parts of a public works program because they are large outlets for investments and employment. For these and similar reasons the federal-ownership movement is not pure and simple; it is mixed up with other matters than public production of electricity, and cannot be reduced altogether to the technical and definite terms of a factual, engineering plan. Americans have a choice between an imperfect national program of electricity production and no program.

Some people reject the public-ownership movement of the federal government because it is based in large part on political feelings. Like businessmen, they want careful consideration of the prospective revenue, management, usefulness, and tax incidence of each improvement. Attention to economical investments and efficient management is commendable; and Congress can use more of it. But municipal, state, or federal production of electricity or any other commodity obviously cannot be disassociated from the political environment that allows it to develop and to exist. At any rate, the general acceptance of public ownership is increasing, and a continuing expansion of the federal program seems to be assured. Persons who receive service from the several projects naturally give strong support to the program; and other voters either anticipate similar improvements in their regions, or are not sharply opposed to public electric service. A choice between private and public production of electricity is not even a minor issue in presidential campaigns. More water-control improvements, combining electricity production with other services, will be built. Federal government departments, regional organizations, and local civic groups will propose many more undertakings; and additional projects will be constructed as general public improvements, or as parts of a job-creating program of public works. These undertakings will lead the way toward the social objective of widespread consumption rather than the private end of maximum profits; they will start a new era in public utility service despite the social inefficiencies, caution, and business-mindedness of their political sponsors and managers.

Public regulation and public production of utility services are not so well planned nor so well developed as they can be. Lawmakers, commissioners, judges, and administrators of publicly owned systems do not take account of their experiences, trying to improve the production and distribution of utility services every time they have a chance. In regulatory matters only a few state commissions and the federal commissions have enough statutory powers, funds, and knowledge for notable achievements; many commissioners, including the members of the best commissions, have a weakness for regulatory routines that is shown particularly today in the use of accounting forms and data; and all commissions, looking to the public instead of the private interest, do not control managerial authority in connection with service extensions, technical innovations, and discriminatory pricing. In another area of public policy the cities and Congress should give further recognition to the distinctiveness of public enterprises, abandoning their obvious adaptations of private investment, tax, and pricing standards and developing forthrightly a new set of criteria for their undertakings. Congress has a special problem in the regionalized politics that limits the vision of project administrators, manipulates investments, and thwarts a firm expression of a national plan of public production. Yet we can anticipate better policies of public regulation and public production, even if the English jurist was partly right when he said that public policy "is a very unruly horse." Although we may not know exactly where we are going, the horse seems quite certain to carry us slowly and roughly toward more effective regulation of private systems and wiser social management of public production.

Appendix

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31. *Electric Bond & Share Co.* v. *S. E. C.,* 303 U.S. 419 (1938).
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33. *Re Lone Star G. Corp.,* 12 S.E.C. 286, 301-303 (1942).
34. *Re Standard Oil Co.* (S.E.C.), Holding Co. Act Release No. 4617, p. 3 (Oct., 1943).

35. See Securities and Exchange Commission, *Third Annual Report,* 1937, pp. 37-38; *Re Montana-Dakota U. Co.,* 1 S.E.C. 350 (1936); *Re Southern Union G. Co.,* 12 S.E.C. 116 (1942); *Re P. S. Co. of Oklahoma* (S.E.C.), Holding Co. Act Release No. 4459 (Aug., 1943); *Re Western L. & Tel. Co.* (S.E.C.), Holding Co. Act Release No. 5902 (July, 1945); *Re Peoples L. & P. Co.* (S.E.C.), Holding Co. Act Release No. 6000, p. 16 (Aug., 1945); *Re Community G. & P. Co.* (S.E.C.), Holding Co. Act Release No. 6436, p. 6 (Feb., 1946).
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42. For examples see *Re Central and South West U. Co.,* 11 S.E.C. 533, 543 (1942); *Re International Hydro-E. System,* 12 S.E.C. 999, 1022 (1943); *Re International U. Co.* (S.E.C.), Holding Co. Act Release No. 4270 (Apr., 1943); *Re Ogden Corp.* (S.E.C.), Holding Co. Act Release No. 4307, p. 9 (May, 1943); *Re The Middle West Corp.* (S.E.C.), Holding Co. Act Release No. 4552, p. 19 (Sept., 1943); *Re Northern States P. Co.* (S.E.C.), Holding Co. Act Release No. 5745 (Apr., 1945); *Re Portland E. P. Co.* (S.E.C.), Holding Co. Act Release No. 6365, p. 24 (Jan., 1946); *Re Washington Ry. & E. Co.* (S.E.C.), Holding Co. Act Release No. 6410, pp. 8-9 (Feb., 1946).
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45a. *American P. & L. Co.* v. *S. E. C.,* 67 S. Ct. 133 (1946).

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53. *Re Columbia G. & E. Corp.,* 8 S.E.C. 443 (1941); *Re The United G. Improvement Co.,* 9 S.E.C. 52, 77-83 (1941); *Re The North American Co.,* 11 S.E.C. 194, 216-217 (1942); *Re Engineers P. S. Co.,* 12 S.E.C. 41, 55-61 (1942); *Re The Middle West Corp.* (S.E.C.), Holding Co. Act Release No. 4846, p. 39 (Jan., 1944); *Re The North American Co.* (S.E.C.), Holding Co. Act Release No. 5707, pp. 6-13 (Apr., 1945).
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55. See *Re Engineers P. S. Co.,* 9 S.E.C. 764, 774-783 (1941); *Engineers P. S. Co.* v. *S. E. C.* (U. S. Cir. Ct. of Appeals), 51 P.U.R.(N.S.) 65, 72-73 (1943).
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58. *North American Co.* v. *S. E. C.,* 66 S. Ct. 785, 798 (1946).
59. *Re The Middle West Corp.* (S.E.C.), Holding Co. Act Release No. 4846, pp. 18ff (Jan., 1944).
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61. *Re Lone Star G. Corp.,* 12 S.E.C. 286, 292-296 (1942). See also *Re United G. Improvement Co.* (S.E.C.), Holding Co. Act Release No. 4505, p. 14 (Aug., 1943).
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63. *Re Cities S. P. & L. Co.* (S.E.C.), Holding Co. Act Release No. 4489, p. 37 (Aug., 1943). See also *Re The North American Co.,* 11 S.E.C. 194, 213 (1942); *Re The Middle West Corp.* (S.E.C.), Holding Co. Act Release No. 4846, p. 35 (Jan., 1944).
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65. *Re American G. & E. Co.* (S.E.C.), Holding Co. Act Release No. 6333, pp. 9, 21-22 (Dec., 1945). But the commission denied a further enlargement of the system: *Re American G. & E. Co.* (S.E.C.), Holding Co. Act Release No. 6639 (May, 1946).
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69. For examples see *Re The United G. Improvement Co.,* 11 S.E.C. 338, 346-347 (1942); *Re Cities S. P. & L. Co.* (S.E.C.), Holding Co. Act Release No. 4489, p. 15 (Aug., 1943); *Re Texas U. Co.* (S.E.C.), Holding Co. Act Release No. 6373, pp. 5-6 (Jan., 1946).
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74. See *Re The United L. & P. Co.* (S.E.C.), Holding Co. Act Release No. 5840 (June, 1945).

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77. *Re Virginia E. & P. Co.* (S.E.C.), Holding Co. Act Release No. 5021 (May, 1944).

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82. *Re Community P. & L. Co.,* 10 S.E.C. 387 (1941).

83. *Re The United Corp.* (S.E.C.), Holding Co. Act Release No. 5440, pp. 2, 13-14 (Nov., 1944); *Re The United Corp.* (S.E.C.), Holding Co. Act Release No. 5812 (May, 1945). See also *Re Standard G. & E. Co.* (S.E.C.), Holding Co. Act Release No. 5430 (Nov., 1944); *Re United G. Improvement Co.* (S.E.C.), Holding Co. Act Release No. 6474 (Mar., 1946).

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88. See *Re The United G. Improvement Co.* (S.E.C.), Holding Co. Act Release No. 5570 (Jan., 1945).

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95. *Re The Middle West Corp.*, 11 S.E.C. 533 (1942); *Re Cities S. Co.* (S.E.C.), Holding Co. Act Release No. 4944 (Mar., 1944); *Re Federal W. S. Co.* (S.E.C.), Holding Co. Act Release No. 4957 (Apr., 1944); *Re York County G. Co.* (S.E.C.), Holding Co. Act Release No. 5480 (Dec., 1944); *Re Electric Bond & Share Co.* (S.E.C.), Holding Co. Act Release No. 6121 (Oct., 1945).

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100. *Re New England P. Assoc.* (S.E.C.), Holding Co. Act Release No. 5839, pp. 4-5 (June, 1945); *Re New England P. Assoc.* (S.E.C.), Holding Co. Act Release No. 6470, pp. 18, 20 (Mar., 1946). See also *Re Republic S. Corp.* (S.E.C.), Holding Co. Act Release No. 6820, p. 13 (Aug., 1946).

101. *Re Jacksonville G. Co.*, 11 S.E.C. 449 (1942); *Re Puget Sound P. & L. Co.* (S.E.C.), Holding Co. Act Release No. 4255 (Apr., 1943); *Re Southern Colorado P. Co.* (S.E.C.), Holding Co. Act Release No. 4501 (Aug., 1943); *Re The Laclede G. L. Co.* (S.E.C.), Holding Co. Act Release No. 5062 (May, 1944); *Re United G. Corp.* (S.E.C.), Holding Co. Act Release No. 5271 (Sept., 1944); *Re Georgia P. & L. Co.* (S.E.C.), Holding Co. Act Release No. 5568 (Jan., 1945); *Re Spokane G. & Fuel Co.* (S.E.C.), Holding Co. Act Release No. 6065, p. 9 (Sept., 1945).

102. For a discussion of this authority see *Re Jacksonville G. Co.*, 11 S.E.C. 449, 454 (1942).

103. *Taylor* v. *Standard G. & E. Co.*, 306 U.S. 308 (1939). For a general discussion of the rule see Securities and Exchange Commission, *Seventh Annual Report*, 1941, pp. 105-107 and *Tenth Annual Report*, 1944, p. 68. For an opinion on the priority position of the preferred stock owned by an affiliated company see *Securities and Exchange Com.* v. *Chenery Corp.*, 318 U.S. 80 (1943).

104. For an example see *Re Stanley Clarke, Trustee of Associated G. & E. Co.* (S.E.C.), Holding Co. Act Release No. 5787 (May, 1945).

105. Securities and Exchange Commission, *Tenth Annual Report*, 1944, pp. 66-67. For an example see *Re The Middle West Corp.* (S.E.C.), Holding Co. Act Release No. 6606, pp. 14-15 (May, 1946).

106. *Otis & Co.* v. *S. E. C.*, 323 U.S. 624, 633 (1945).

107. Securities and Exchange Commission, *Eleventh Annual Report*, 1945, pp. 35-37.

108. See Robert Blum, "SEC Integration of Holding Company Systems," *Journal of Land & Public Utility Economics*, v. 17, November, 1941, p. 439.

Chapter 9: CONTROL OF COMPETITION

(*Pages 190-212*)

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13. *New State Ice Co.* v. *Liebmann*, 285 U.S. 262, 282 (1932).
14. *Behnke* v. *Wisconsin G. & E. Co.* (Wis.), 15 P.U.R.(N.S.) 217, 220 (1936); *Raytown W. Co.* v. *Independence Waterworks Co.* (Mo.), 32 P.U.R.(N.S.) 117 (1939).
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5. *Ohio Bell Tel. Co.* v. *P. U. Com. of Ohio*, 301 U.S. 292, 303 (1937).
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Chapter 11: CONTROL OF EXPENDITURES

(Pages 236-257)

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Chapter 12: PROPERTY VALUATION: THE LEGAL CONCEPT

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Chapter 13: A REVIEW OF VALUATION STANDARDS

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Chapter 14: VALUATION OF INTANGIBLE PROPERTY

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Chapter 15: DEPRECIATION

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Chapter 16: THE SPECIAL PROBLEM OF OBSOLESCENCE

(Pages 352-371)

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4. *Re Yonkers R. R. Co.* (N.Y.), 9 P.U.R.(N.S.) 337, 352 (1935).
5. *West* v. *United Rys. & E. Co.* (Md. Ct. of Appeals), P.U.R. 1928D 141, 174; *St. Louis* v. *P. S. Com. of Missouri* (Mo. Sup. Ct.), P.U.R. 1932A 305, 320; *St. Louis* v. *P. S. Com.* (Mo. Sup. Ct.), 22 P.U.R.(N.S.) 6, 40 (1937).
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Chapter 17: THE RATE OF RETURN

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Cleveland and Akron v. *Hope Nat G. Co.* (F.P.C.), 44 P.U.R.(N.S.) 1, 33 (1942); *Detroit* v. *Panhandle Eastern Pipe Line Co.* (F.P.C.), 45 P.U.R.(N.S.) 203, 215 (1942); *Re Mississippi R. Fuel Co.* (F.P.C.), 63 P.U.R.(N.S.) 89, 99 (1946).

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Chapter 18: CONTINUITY OF EARNINGS REGULATION

(Pages 396-418)

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